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ORIGINAL ARTICLES.

ETIOLOGY, DIAGNOSIS AND TREATMENT OF BENIGN STENOSIS OF THE PYLORUS.[1]

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IN response to an invitation from the President of this society, I shall present for your consideration and discussion this evening, a brief review of our present knowledge of the etiology, diagnosis and treatment of benign obstruction of the pylorus.

In accepting this invitation, I realize fully that I am addressing an audience made up largely of expert observers in this line of work. I also recognize the fact that my own experience in gastric surgery is a comparatively limited one. I may, therefore, be permitted to state at the outset that my reason for presenting this subject before this Society is not that I hope to enlighten its members by anything new or original, but simply to bring this important topic before you for your critical discussion, which cannot fail to be of value to myself as well as to the profession at large.

Although dilatation of the stomach due to pyloric stenosis has been known as a pathological entity for centuries and its association with vomiting, delayed and painful digestion recognized in certain instances, it was not until the latter part of the nineteenth century that its importance began to be appreciated, and the differentiation between the benign and malignant forms of the stenosis made.

In 1868, Victor Bros, in his Strassburg thesis, reviewed the subject of benign obstruction of the pylorus and gave a classical description of the symptomatology of a typical case of the disease due to gastric ulcer.

The following year Kussmaul began the use of the stomach tube in the treatment of this condition and led the way for his pupils, Von de Velden, Leube, Ewald, Boas and a host of others, who studied the effects of obstruction on the function of digestion, and furnished valuable data for diagnostic purposes in the estimation of the motility of the organ and the chemical analysis of the gastric contents.

The first effect of a moderate narrowing of the pylorus is obviously an increased peristaltic effort on the part of the muscular apparatus of the stomach, to propel the food into the duodenum. This in an otherwise healthy individual generally results in a compensatory hypertrophy of the gastric musculature, and while this compensation is maintained no untoward symptoms occur. Sooner or later, however, if the disease is progressive, this compensation fails and a certain quantity of the food is habitually retained in the stomach. As in the case of the urinary bladder, this inability of the viscus to empty itself gradually results in dilatation of the organ with atony of its muscular walls. Stagnation of the gastric contents results in fermentation—fermentation gives rise to the formation of acrid acids and gases, which in turn irritate the mucosa and eventually cause a subacute gastritis or catarrh of the stomach.

Relief to the overburdened and irritated stomach can only occur from vomiting. This takes place at first at infrequent intervals, later more regularly, and when the obstruction becomes practically complete, after each meal.

As the stenosis increases a progressively diminishing amount of food passes into the intestine, and as absorption of water from the stomach itself is practically *nil*, thirst, diminished secretion of urine, constipation and rapid emaciation occur. When the obstruction becomes complete, death from starvation is the inevitable result.

The foregoing description applies to a progressive stenosis resulting in complete obstruction. In certain instances, however, the disease advances up to a certain point and then becomes arrested. In these cases the symptoms will vary according to the degree of obstruction, and the muscular tone of the organ. In general it may be stated that a stomach which is unable completely to empty itself over night, will surely give rise to symptoms requiring treatment.

In considering the etiology of benign stenosis of the pylorus, we should, I think, follow the suggestion of Mayo, who maintains that lesions in the first two and a half inches of the duodenum should be included, as the pathological conditions producing stenosis in the portion of the duodenum above the papilla are practically identical with those of the pyloric region, and the resulting symptoms so similar that differential diagnosis is in most instances impossible except by exploratory incision.

The commonest cause of benign stenosis of the pylorus is undoubtedly ulcer. Gastric ulcer occurs at or near the pylorus with great frequency, most authorities agreeing that at least 75 per cent. of the lesions are found in this region. That duodenal ulcer is also of frequent occurrence is evident by the statistics of Mayo, who reports that the first portion of the duodenum was involved in 27 per cent. of his operated cases of ulcer.

A gastric or duodenal ulcer may produce a primary pyloric stenosis, either by the presence

[1] Read at the Annual Meeting of the American Gastro-Enterological Association, April 25, 1905.

of an acute inflammatory exudate in the surrounding tissues or at a later stage by marginal induration or cicatricial contraction. Not infrequently when the process involves the deeper tissues or where a minute perforation has occurred, a circumscribed or spreading peritonitis is developed, which, if recovery takes place, results in the formation of adhesions which give rise to stenosis from angulation or fixation of the pylorus to the other organs.

Obstruction of the pylorus by spasm, caused by the irritation of an ulcer in some other portion of the stomach is said to occur and to give rise to the same train of symptoms as organic stenosis, but as Stockton has pointed out, too much reliance must not be placed on this statement which at present rests only on an hypothetical basis.

Diseases of the gall-bladder are second in point of frequency in the causation of pyloric stenosis. The commonest lesion of the gall-bladder to produce this effect is cholecystitis with local peritonitis. This gives rise to secondary adhesions which produce angulation and fixation of the pylorus or duodenum in the same manner as the adhesions from a perforated ulcer.

Fistulous openings between the gall-bladder and stomach or duodenum may occur, as a result of suppurative cholecystitis. Through these openings large stones may occasionally pass into the intestine. The presence of these stones may, very rarely, give rise to obstruction, whereas the cicatricial contractions of the fistulous tract and the perigastric adhesions more frequently cause narrowing of the pylorus and duodenum.

A case illustrating the degree to which narrowing of the pylorus and duodenum may reach from such a condition is the following:

Case.—A man, fifty-four years of age, had numerous attacks of pain and tenderness in the right upper quadrant of the abdomen. Later he had gastric distress and vomiting. These symptoms increased rapidly in severity and he became emaciated, weak and anemic. When first seen by the writer he stated that he had lost fifty pounds in the previous two months. The abdomen was very much retracted and a tumor was felt in the pyloric region which did not move with respiration. Stomach enormously dilated, no free hydrochloric acid present; hemoglobin, 40 per cent.

On opening the abdomen, the gall-bladder, pylorus and duodenum were found fused together by dense adhesions. The gall-bladder was opened and found to contain a quantity of pus and seventeen stones. When these were removed, the examining finger passed through a narrow opening into a secondary cavity also containing numerous calculi. We at first thought we had to do with a double gall-bladder, but after a long and difficult dissection, it was found that the supposed accessory gall-bladder was in reality, a pouch formed by the first portion of the duodenum into which the suppurating gall-bladder had emptied. This cavity was separated above from the stomach and below from the second portion of the duodenum by two large, almost complete cicatricial strictures, each intimately associated with the inflammatory induration around the margin of the fistulous opening. On laying open this duodenal pouch thirty-six stones and a moderate amount of foul-smelling pus were evacuated. A pyloroplasty by the Finney method was performed, but the patient succumbed to the shock of the prolonged operation. In this case the occlusion had been practically complete for a number of weeks.

The presence of benign tumors at or near the pylorus, has occasionally been reported as giving rise to obstruction. The writer on one occasion found and removed a small adenoma from the anterior wall of the duodenum just above the papilla. Lipomata arising from the submucous layer of the stomach, near the pylorus, have occasionally been reported, some reaching a large size. Myomata papillomata and lymphadenomata have also been found but are exceedingly rare and as a rule too small to produce serious obstruction. A few instances are on record of a polypoid tumor with long pedicle, which would occasionally be carried into the pyloric orifice and produce intermittent occlusion.

More important than the preceding group are the hypertrophic stenosis. This condition has been described by a number of observers including Tilger, Boas, Habershon and Oettinger, and each has given it a different name. Practically all unite, however, in regarding the obstruction as one of hypertrophy and sclerosis of the muscular and submucous coats, causing great narrowing and rigidity of the orifice. The pyloric region is often so thickened that a distinct tumor may be felt through the abdominal wall.

Three varieties of the affection have been described: First, the congenital stenosis, in which there is thickening of the submucous coat with hypertrophy of the circular and longitudinal muscular fibers, but without lesion of the mucous membrane, obviously a non-inflammatory condition; second, the adult type which appears to follow a chronic gastritis in which the mucous and submucous coats of the entire stomach are involved, giving rise to a cirrhosis of the organ, and third, where the disease seems limited to the pyloric region. In the cirrhotic variety the capacity of the stomach is greatly reduced and dilatation is impossible, while in the third variety, dilatation is generally present.

The importance of syphilis as an etiological factor in the production of pyloric stenosis has been variously estimated by different authorities. Engel reports a syphilitic history in 10 per cent. of all his ulcer patients. Stockton has reported several in which the symptoms have yielded promptly to antisyphilitic treatment, and numerous autopsies have demonstrated beyond a doubt that gummata and typical syphilitic ulcers may exist at or near the pylorus and give rise to more or less serious obstruction.

Among the rare forms of pyloric obstruction may be mentioned foreign bodies, masses of hair, wool or other non-absorbable substances which have been swallowed and rolled into large balls by the muscular movements of the organ, also benign tumors of the liver, gall-bladder ducts or pancreas pressing on the stomach or duodenum, enlarged lymph nodes and possibly kinking of the duodenum from gastroptosis or movable kidney. Mayo has described a volvular formation due to inflammatory shortening of the gastrohepatic omentum.

In considering the clinical history of pyloric obstruction it must be borne in mind that we may and frequently do have two distinct groups of symptoms; first, those due to the disease which gives rise to the stenosis, and second, those due to pyloric narrowing and the resulting gastrectasia and the chemical changes which occur in the retained gastric contents. The first effect of pyloric narrowing is retardation in the normal emptying of the stomach after an ordinary meal. This may give rise to no subjective symptoms, and the only indication of such retardation may be that furnished by the use of the stomach tube which shows that the viscus still contains a portion of the ingested food at a period when it should be empty. Riegel states that after an ordinary meal, the stomach should be found empty in seven hours. In mild degrees of motor insufficiency, food will still be found in the stomach seven hours after a meal, but not in the early morning after a light supper the previous evening. In general the degree of motor insufficiency may be estimated by the amount of food residue found at various times after the taking of a test meal.

Occasionally patients with mild degrees of motor insufficiency complain of a sense of weight and discomfort in the epigastrium after a heavy meal but not when a moderate amount of food is taken. There is, as a rule, no actual pain and the symptoms disappear as soon as the stomach is empty. In more advanced cases of stenosis, where compensation is present, the peristaltic movements of the stomach can occasionally be seen or felt through the abdominal wall. This may be associated with a subjective symptom which Kussmaul has described as peristaltic unrest. When the stomach begins to dilate and fermentation takes place, the patients complain of a greater degree of fulness and epigastric pressure after each meal. Eructations occur, which may be odorless or foul, from the presence of sulphureted hydrogen. Not infrequently heartburn is present from the occurence of fatty acids in the fermenting gastric contents.

Of all the symptoms of pyloric obstruction, however, vomiting is the most important and characteristic. It may occasionally occur in the earlier stages of motor insufficiency before dilatation has taken place, but when gastrectasia and fermentation are developed it is more or less constantly present, and in the most advanced cases it occurs after each meal.

It is characterized by the large amount of food expelled at one time and the fact that the vomited matter often contains particles of food taken the day, or several days, before. As a rule the vomitus is acid in taste and smell, and often foul from decomposition. When allowed to stand it generally separates into three distinct layers—the upper of froth, the middle of a grayish fluid and the lower of solid particles of food.

As vomiting gives relief in the majority of instances, patients not infrequently get into the habit of inducing it whenever the gastric distress is severe. In advanced grades of pyloric obstruction, the patients suffer greatly from lack of fluids. This gives rise to intense thirst, dryness of the skin and mucous membranes and a marked diminution in the excretion of the urine. Crámer is accustomed to estimate the degree of dilatation by the quantity of urine excreted, dividing his patients into three classes, the mild when 1,500 c.c. or more is excreted in twenty-four hours, those of medium severity when the urinary excretion is reduced to 1,000 c.c. and the severe cases when the excretion is 500 c.c. or less.

Loss of weight necessarily begins as soon as the stenosis reaches such a degree that the requisite amount of food is not forced into the intestine, it is usually progressive and in the end emaciation is extreme. Progressive anemia is present in all of these cases, the degree generally corresponding with the rate of emaciation.

In the later stages of gastrectasia patients generally complain of loss of appetite, headache, mental torpor and various paresthesias. In a certain number of cases tetany will develop, evidenced by the occurrence of tetanic contractions in the hands, arms and legs, with occasional trismus and transitory blindness. This frequently follows severe vomiting or an attempt to pass a stomach tube, and unless gastric drainage is at once instituted, the disease proves fatal in a large proportion of the cases.

With the exception of those cases where a tumor can be planted in the pyloric region, there are no physical signs which help us to a diagnosis in the early stages of benign stenosis. When gastrectasia occurs, however, physical examination frequently furnishes important data. Inspection will often reveal the outlines of a dilated stomach through a thin abdominal wall. Occasionally the greater and lesser curvatures can be palpated, and splashing may often be elicited at a time when the stomach should normally be empty. Distending the stomach with air or water will often enable us by percussion to identify its limits and thereby form a fairly reliable estimate of its size. In general it may be stated that with the lesser curvature in its normal position, when the greater curvature can be demonstrated at or below the umbilicus, dilatation is presnt.

The foregoing description applies only to instances of uncomplicated benign pyloric stenosis. It is perhaps the exception to find adult cases which present such a typical clinical history, as

the symptom complex in the majority of instances is modified by the occurrence of some preceding or accompanying pathological condition which gave rise to the stenosis.

In those cases due to ulcer therefore we are apt to have a history of digestive disturbance long before the signs of pyloric obstruction occurred. In the majority of instances such patients complain of more or less acute attacks of epigastric pain after eating, often with vomiting of acid material at the height of the attack.

They have generally restricted their diet because certain articles of food seemed to produce more distress than others, and as a result are frequently emaciated and anemic. There may be a history of hematemesis or melana.

In those cases in which the stenosis is due to the late contraction of the scar of an ulcer, or to peritoneal adhesions due to ulcer, there may be a distinct interval between the symptoms of ulcer and those of pyloric obstruction. In the great majority of cases, however, the history would indicate that the early symptoms of obstruction were due to the induration surrounding an open ulcer, and in these instances the cardialgia, eructations, epigastric tenderness and vomiting overshadow for a time the comparatively mild symptoms of early motor insufficiency. Under these conditions the pain is often more severe than in ulcer without obstruction, due to the mechanical irritation of the ulcer by the increased muscular action of the stomach to force the food into the intestine. While the pain is frequently limited to a small area in the epigastrium which is often exquisitely tender, it may radiate to the back, the breasts, to the neck or hypochrondriac regions. The suffering in these cases is often extreme until relieved by vomiting of an abundant acid material.

Hyperchlorhydria is present in practically all of these cases, as demonstrated by gastric analysis. Not infrequently there is in addition a more or less continuous secretion of gastric juice evidenced by morning vomiting of a cloudy acid fluid containing a few flakes of solid matter. Later when dilatation has occurred this morning vomiting contains remnants of food taken the evening before.

As in other cases of gastric ulcer, the symptoms may undergo marked variations in intensity, owing to care exercised in the diet and the employment of rest and other remedial measures.

It may happen that the symptoms of ulcer may cease entirely, leaving only those of a progressive gastrectasia; on the other hand the pain may persist throughout the disease to the end. In the later stages of the affection, the appetite which in the beginning with an abundant hyperchlorhydria was exaggerated, almost invariably is lost and there is instead a disgust for food of any kind.

In those cases of obstruction due to adhesions from gall-bladder suppuration, there is usually a history of attacks of pain in the upper abdomen, which, however, do not exhibit the same relation to the taking of food as in gastric ulcer. In these attacks the pain and tenderness are located chiefly in the right hypochondriac region and the vomiting when it occurs is mostly at the beginning of the attack. There is no evidence of hyperchlorhydria. In addition there is generally a history of one or more severe attacks accompanied by fever and other evidences of local peritonitis. The occurrence of jaundice is occasionally mentioned.

As the symptoms of gall-bladder and duct disease are practically always intermittent, with long intervals of quiescence, the presence of pyloric obstruction and gastrectasia, is generally indicated by the occurrence of more or less typical symptoms of this condition which, however, may at any time be interrupted by those of an acute gall-stone colic or attack of cholecystitis.

Although it would be quite impossible in the limited time at my disposal to review the symptomatology of all of the rarer lesions giving rise to pyloric stenosis, I desire to call attention briefly to one of the varieties of this malady which has not received from the profession at large the attention it deserves.

Congenital stenosis of the pylorus was first described by Beardsley, of New Haven, in 1788. Meltzer, in the *Medical Record* of July 20, 1898, reviews the literature of the subject and gives the clinical history of a case under his care, together with the appearances found at operation and the pathological report of the specimen obtained at autopsy.

Dorning has recently reported another case with typical symptoms, in which he was able by palpation to detect a pyloric tumor during life. He stated that at the time of his report, about sixty cases had been recorded. Meltzer states that the life history of these cases may be divided into three phrases: First, the period of simple muscular insufficiency; second, an attempt at compensation, and third, the stage of atony and progressive dilatation.

The clinical histories of the reported cases show a striking similarity, and correspond to the three periods described by Meltzer.

At first the child nurses with avidity but soon regurgitates the meal. After several such attempts the mother generally finds that if a small feeding only is allowed it may be retained. Vomiting may therefore be infrequent for a few weeks after birth, the frequency depending largely on the degree of stenosis. During this period the child is generally restless between feedings and shows evidence of constant thrist. Sooner or later the stage of atony and dilatation occurs and the vomiting becomes more frequent and exhausting. The child grows progressively weaker, emaciates and may develop stupor and other nervous symptoms. At this period the stomach can generally be demonstrated to be dilated and flaccid, the urine is scanty and constipation is marked.

The use of the stomach tube is of great value in confirming the diagnosis in these cases. The presence of food in the stomach two hours after a feeding, when associated with the above symptoms, is sufficient to establish the diagnosis.

In considering the treatment of benign pyloric stenosis it seems hardly necessary to say more than a few words to an audience the members of which appreciate so keenly the fact that the cause of all the untoward symptoms of this disease is purely a mechanical one, and can be relieved only by reestablishing a normal connection between the stomach and intestine. It would be a waste of time even to consider drugs, massage, electricity and lavage, which at best can only be regarded as palliative measures. With the exception of the few instances in which the obstruction is so light that the symptoms can be easily relieved by dietetic regulation, or in those exceedingly rare cases where the stenosis is due to a syphilitic ulcer or gummatous deposit, and which quickly respond to anti-syphilitic treatment, surgery and surgery alone can offer relief to these patients. In perhaps no other class of operations upon the alimentary canal have the results of surgical intervention been more strikingly satisfactory.

It will sometimes be possible to remove the causes of the stenosis by operation, such as peritoneal bands or adhesions, new growths or enlarged lymph nodes pressing upon the pylorus or first part of the duodenum, foreign bodies or benign tumors of the stomach wall. In the majority of instances, however, it will be necessary either to enlarge the contracted pyloric orifice by plastic operation or to create a new opening between the stomach and small intestine. Digital dilatation of the pylorus has been abandoned by surgeons.

The original pyloroplasty of Heinecke-Mikulicz is gradually giving way to other more radical procedures for the reason that recurrences after its employment were frequent. The operation of Finney and posterior gastro-enterostomy are the two procedures employed at present for the relief of pyloric stenosis. Finney's operation which consists in enlarging the pyloric opening by a plastic operation which unites the first portion of the duodenum with the adjacent wall of the stomach is the operation of choice in cicatricial stenosis where the tissues are not too much infiltrated, in all other cases gastro-enterostomy is to be preferred. The technic of these procedures is so well known that a description of it here would be superfluous.

As the mortality of these operations are capable in hands, where the physical conditioh of the patient is still fairly good, should be below 6 per cent. in benign cases, and as a permanent cure may be expected in the majority of cases, it is difficult to appreciate why the rank and file of the profession should not give their unqualified approval to this method of treatment and why it is not more generally practised.

CASE OF PEPTIC ULCERS AFTER GASTRO-ENTEROSTOMY CAUSING GASTRO-COLIC AND JEJUNO-COLIC FISTULAE, AND OF SPONTANEOUS CLOSURE OF GASTRO-ENTERO-ANASTOMOSIS.[1]

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THE history of the case which I want to report to you presents a remarkable development of gastric disturbances following a gastro-enterostomy, performed in December, 1901, on a man then forty-four years of age.

During the three years previous to this operation, the patient had suffered periodically from more or less severe gastric pains. Three times severe hematemesis had occurred and once there were all the symptoms of perforation, followed by localized peritonitis in the pyloric region. There was hyperacidity, some motor insufficiency and a pyloric tumor, which during the time of pronounced disturbances could easily be felt as a hard mass and which as a rule became smaller and less distinct after treatment.

Three times a strict treatment for ulcer had been carried out and in addition to this at several periods local treatment, lavage with silver nitrate, bismuth, etc., had been used. Once a long course of specific treatment was given because one of the patient's former physicians had diagnosed syphilis on account of an eruption on the lips and hands which he had treated several years previous to the development of the gastric symptoms and which had yielded only to iodide of potassium. The patient and his former physician denied syphilis most emphatically. However, since there was a difference in the size of the pupils both of which reacted poorly to light, the mercurial treatment was given a trial with no perceptible effect upon the ulcer. Nine months after the specific treatment, the third and most profuse hematemesis took place.

After renewed internal treatment for ulcer following this hematemesis had been rigidly carried out for six weeks, the patient vomited great quantities of strongly acid, fermenting masses. mixed with blood, and showed visible gastric peristalsis. These symptoms of increasing pyloric stenosis and the recurrence of hematemesis in spite of all the internal treatment, led to the operation.

At the operation, performed in December, 1901, by Dr. Lange, the pylorus was found to be thickened and its posterior wall adherent. Its anterior surface showed areas of marked thickening and opacity of the serous covering, one spot, probably the seat of the former perforation, being distinctly retracted. Retrocolic posterior gastro-enterostomy was performed. A very high jejunum loop had been taken and since the angle caused by the fixation seemed rather acute, the

[1] Read at the Eighth Annual Meeting of the American Gastro-Enterological Association, New York April 24 and 25, 1905.

afferent and efferent portions of the jejunum were connected by an entero-anastomosis. Silk sutures were used. Recovery was smooth, the only disturbance being caused by pronounced constipation during the first week. During the following three months there were no gastric symptoms and the patient gained 27 pounds. After this time gastric disturbances recurred. At first these were of mild character; pressure and discomfort about an hour after meals, but were followed later on (May, 1902) by more severe abdominal pains regularly coming on in the afternoon. On examination, the pyloric resistance was distinctly palpable, the stomach appeared large and atonic, and the stomach contents showed pronounced hyperacidity.

In October, 1902, severe cerebral symptoms appeared; difficulty in speaking and writing, defective memory, muscle tremor, exaggerated reflexes, papillitis on both sides, convulsions and periods of unconsciousness with complete amnesia afterward. Energetic mercury treatment was given and large doses of iodide of potassium for a long period. In February and March a few shorter attacks of mental disturbance occurred. After this there were no more cerebral symptoms.

In April, 1903, the abdominal pain which had hitherto been of a moderate character, became very severe. It generally came on in the afternoon or at night and was of such severe character that nothing but morphine would relieve it.

As a rule this pain was located in the upper abdomen, but at times it irradiated into the lower. While it lasted, the transverse colon could often be felt as a stiff, sausage-like tumor, which became softer when the pain grew less. This feature was especially noticeable after the administration of morphine. One could often feel gas escape with the relaxation of the tumor.

For periods of weeks and months the pain came on almost daily. There were other periods of weeks and even of months of perfect freedom from abdominal pain, especially in the summer of 1903 and 1904, while the patient was in the mountains. In November, 1903, six months after the abdominal pain first became severe, the patient complained for the first time of sulphurous taste and belching for several days and then vomited large quantities of fluid fecal matter. Lavage of the stomach was begun. The vomiting was not repeated but the complaint of fecal taste and the finding of fecal matter in the stomach became more and more frequent and finally, during the winter of 1904-1905, became constant. At first there were periods of weeks and months when stomach lavage performed at any hour of the day showed absolutely no fecal matter. During such periods, which were noted as late as the summer of 1904, examination of the fasting stomach and after test-meals showed pronounced hyperacidity and good motor activity, or at most, motor insufficiency of a mild degree. Even at the periods when fecal matter was found in the stomach, there were no signs of stagnation of food taken by mouth.

At the periods when fecal matter got into the stomach, it was often found in the fasting organ. Very often it entered the stomach only after a meal. The patient could recognize it by the fecal belching and could verify it by removing fecal matter from his stomach by the tube, even when the stomach had been cleaned by lavage before the meal. The same phenomenon was observed during lavage. After the wash-water had returned from the stomach perfectly clear several times, it would suddenly become mixed with fecal matter. Sometimes the flow of fecal matter would continue as long as the washing was kept up. The quantities of fecal matter thus removed by the tube were often very large.

Occasionally small formed feces were found. As a rule, however, the fecal masses were more fluid; they were in every way like the fecal matter obtained by defecation, in color and smell, in macroscopic and microscopic appearance. When removed from the stomach in the morning or a number of hours after meals, they never showed undigested food remnants.

The feces obtained from the rectum were large, semisolid, mostly light-gray, often acid from gas fermentation, showed enormous quantities of bacteria and were always well digested. Undigested food remains were never found, even when the stools were washed through a sieve. The chemical examination showed neither hydrochloric acid nor pepsin; albumin digestion examined by Mette's method, proved negative. Defecation was on the whole regular but at times, especially during attacks of severe pains, constipated.

There was no stagnation in the stomach of food taken by mouth; fecal matter would enter the stomach, but we could not demonstrate that stomach contents entered the colon. The existence of a gastro-colic fistula was finally proved by the following test:

A prolonged lavage of the stomach with consequent removal of great quantities of fecal matter was directly followed by a prolonged lavage of the rectum and colon. When the wash-water from the colon appeared somewhat clear, a suspension of lycopodium stained by gentian violet was introduced into the colon under slight pressure. A second lavage of the stomach carried out immediately afterward again produced great quantities of fecal matter, which on microscopical examination proved to be thoroughly mixed with the stained lycopodium.

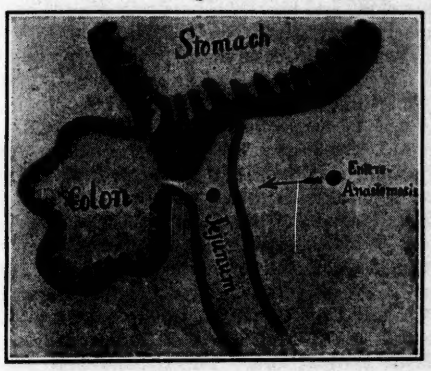
During the winter of 1904-1905 the condition became unbearable. The severe abdominal pain occurring at all hours of the day and at night made the patient a confirmed morphinist. Three more courses of specific treatment (April, 1903, June, 1903, January, 1905), had no effect; nor did any other treatment give relief.

The patient, being very much annoyed by the

constant flow of fecal matter into the stomach readily consented to the proposed operation.

The operation performed by Dr. Gerster (March 7, 1905), showed the middle portion of the transverse colon to be somewhat stiff and narrowed. It was adherent above to the larger curvature of the stomach, and posteriorly to that loop of the jejunum which had been used in performing the gastro-enterostomy. The apex of this greatly dilated loop was hidden behind the colon. After turning up the colon, we found a connection between the posterior wall of the

Fig. 1.*



colon and a diverticulum of the jejunum, which must have been formed by traction. On section, this connection proved to be an open channel of considerable diameter between the cavities of the colon and the jejunum. The edges of the openings were soft and covered by mucous membrane. They showed neither infiltration nor ulceration. Both openings were closed by a Lembert suture. Then the colon was reflected and after the removal of a number of omental adhesions, it became evident that there existed another and larger connection between the upper surface of the transverse colon and the posterior wall of the stomach, which on dissection was also found to be an open channel uniting the cavities of the stomach and the colon. These two apertures, the edges of which were also soft and covered by mucous membrane, were sutured. It then became evident that the two openings connecting the colon, on one side with the stomach and on the other with the jejunum, were quite near together. The colon, which was already somewhat narrowed, became still narrower in consequence of this double suturing, to such an extent as to cause fear of a pronounced stenosis.

We had the choice of resecting this narrowed portion of the colon or of connecting the ascending colon with the sigmoid flexure. The latter proceeding was adopted because the intimate and extensive adhesions of the colon to the posterior parieties made resection a very hazardous undertaking. Since the operation had already lasted three hours, the Murphy button was used.

Recovery seemed uninterrupted during the first six days after the operation. Suddenly, on the sixth day, symptoms of perforation developed, followed by collapse. Immediate laparotomy showed that the perforation was caused by a continued necrosis of the sigmoid flexure, issuing from the site of the Murphy button.

I quote a few points from the post mortem: "On studying the relation of the fistulæ after removing the sutures, we found: (1) A hole in the stomach, surrounded by enormously hypertrophic folds of the gastric mucous membrane, one of which covered the hole from the gastric side completely and acted as a valve. (2) That the two holes in the colon were quite close to each other. In cutting the sutures the intervening bridge was destroyed. The upper hole corresponded to the hole in the stomach, and the lower one to the opening in the jejunum. The gastro-colic and the jejuno-colic fistulæ were opposite each other, so that a glass probe could be passed directly from the stomach through the two holes in the colon into the jejunum; (3) That the hole in the jejunum was situated in the diverticulum of the efferent portion, which was very much dilated; the afferent portion was short and formed a straight line from the plica duodeno-jejunalis toward the stomach.

Fig. 2.*

Absolutely no traces could be found of the opening between the jejunum loop and the stomach, which was made at the primary gastro-enterostomy. The apex of the jejunum loop was adherent to the lower surface of the transverse mesocolon, but it was entirely separated from the stomach. The opening of the entero-enterostomy, though small, was still patent; it was in close vicinity to the jejuno-colic fistula, which was about 5 cm. below the apex of the jejunum loop. The pylorus was patent, but at

* The drawings do not give the exact anatomical relations and are meant to be only diagrammatic. The jejunum-loop is here shown attached to the stomach, in order to demonstrate the situation of the former gastro-entero-anastomosis.

one point markedly narrowed, showing on its inner surface the scar of the old ulcer.

The transverse colon at the level of the fistulæ was thickened and measured only 7 cm. in circumference, while the hepatic part of the transverse colon was dilated to 10 cm. circumference and thinned out. The descending colon measured only 4¼ cm.

There were no anatomical evidences of syphilis, either in the vessels or the viscera (including the brain and the testicles). The larger branches of the abdominal aorta showed slight arteriosclerotic changes. The smaller ones and the thoracic aorta and its branches were free.

In reviewing this case, we must consider separately: (1) The closing of the gastro-entero-anastomosis. (2) The formation of the fistulæ.

The gastro-entero-anastomosis had entirely disappeared. The closing of the anastomotic opening was so complete that it was impossible to locate it. Even the connection between the jejunum-loop and the stomach did not exist any more; the jejunum loop was entirely separated from the stomach. We cannot say how soon after the operation the anastomosis had closed up. So far only a few anatomical facts have been reported, which give information about the final outcome of gastro-entero-anastomosis in benign cases.

G. Gayet described a case which showed the same conditions as our case. He found at a second operation performed one year after gastro-enterostomy, that the first opening had completely closed, that the intestine had been absolutely separated from the stomach, and was only kept adherent to the transverse mesacolon.

Mayo, Feldmann, Robson and Moynihan have reported cases in which a second operation was performed, because the anastomosis had closed. In most of these cases it is simply stated that the opening had contracted; in only one case is it specifically stated by Robson and Moynihan, that the opening had completely closed. There are further a few reports of findings at post-mortems: Ferrari found in one case, three years after operation, an anastomosis of only 2 mm. diameter; in another case, six months after operation, an opening of 4 mm. diameter. Jaboulay reports an autopsy after six months, another after a year, with the opening very much restricted. In another group of cases, the opening was found still patent; in Cordier's, even six years after the operation. I saw the opening patent in a case (not published); two years after the operation. More facts must be obtained before we can explain why the anastomosis remains open in one case and closes in another. The complete disappearance of all traces of the anastomosis in our case is certainly very remarkable.

In regard to the development of the fistulæ I would like to suggest the following explanation: The abdominal pains from which our patient suffered so severely must be attributed to a new gastric ulcer which developed near the former gastro-entero-anastomosis. We may class this ulcer with the group of peptic ulcers following gastro-enterostomy. Tiegel has recently published a review of 22 such cases, in which the peptic ulcer was demonstrated either at the post mortem or at a second or third operation. In most of them the peptic ulcer was found in the jejunum. In some it developed directly on the edges of the gastro-entero-anastomosis. In one case, reported from Czerny's Klinik, a peptic ulcer had developed in the stomach near the gastro-entero-anastomosis, caused adhesions to the colon, and had then perforated into the colon, thus forming a gastro-colic fistula.

The same process, in all probability, took place in our case, but in addition, after the gastro-colic fistula had developed, a second peptic ulcer formed in the colon, opposite the fistula. This second ulcer in turn led to adhesions to the jejunum, into which it perforated, thus forming the jejuno-colic fistula. As a result of these ulcerative and perforating processes adhesions were formed between the stomach and colon, and the colon and jejunum leading to a narrowing of the involved part of the transverse colon.

During life this section of the colon could often be felt as a sausage-like tumor, stiffened by spastic contractions. The spasms were probably caused by the irritating effect of the highly acid gastric secretion on the colon, in the same way in which pylorospasm is caused in case of pyloric ulcer. The frequent spastic contractions of the colon may have contributed to another effect of the adhesive processes, *i.e.*, the formation of the diverticulum of the jejunum by traction.

The fact that we did not find undigested food in the feces is fully explained by the presence of the large fold of the gastric mucosa which, acting as a valve, easily prevented the passage of formed masses from the stomach into the colon, although it could not prevent the flow of gastric secretion into the colon.

The manner in which these peptic ulcers develop after gastro-entereostomy is not yet clear. According to Tiegel, it does not seem that the technic of special methods has great influence, since a study of his 22 cases shows that they occur after all the different methods of operating. Since they occur only in cases of benign diseases of the stomach, it is probable that on the whole the conditions for the development of such peptic ulcers are the same as those for the development of the primary ulcer, *i.e.*, chronic gastritis, hyperacidity, circulatory disturbances, etc. The locality, however, in which the peptic ulcer appears, makes it certain that the operation itself is the direct cause of its development. Perhaps lesions of the mucous membrane, created at the operation, form the basis for the peptic ulcer. Tiegel names arteriosclerosis as a contributory cause. It hardly touches the question in our case, since the arteriosclerotic changes were only moderate and con-

fined to the larger branches of the abdominal vessels.

We have further to consider the question of syphilis in our case. Even if we assume that the patient at one time had syphilis, there is nothing that would permit us to connect it with the formation of the gastric ulcers and the fistulæ. A thorough anatomical examination of the abdominal viscera showed no signs of syphilitic processes, nor did the repeated and prolonged anti-syphilitic treatment yield any apparent result.

At present, syphilis is frequently accused of causing gastric ulcer. However, in only a comparatively small number of cases, has this connection been proved by anatomical examination (Flexner-Trinkler). The mere fact that a patient with gastric ulcer suffers or has previously suffered from syphilis cannot be taken as sufficient proof. In our case the thought of syphilis was for a long time misleading in the interpretation of the predominant symptoms. The attacks of severe abdominal pain, which occurred after the development of cerebral symptoms, we at first regarded as gastric or enteric crises caused by syphilitic disturbances of the cerebrospinal system. Even when fecal matter was found in the stomach, it was considered doubtful whether we had to deal with organic or only functional disturbances, because the fecal matter was found only during certain periods, while at other periods of weeks and months the stomach was free, and also because the patient showed other symptoms of hysteria. The lycopodium test settled this question definitely, proving the presence of a gastro-colic fistula.

It is probable that a knowledge of the frequency of peptic ulcer after gastro-enterostomy would have made clear the true nature of the disturbances in our case before the post mortem.

The development of peptic ulcer after gastro-enterostomy is by no means rare. The 22 cases collected by Tiegel are only cases in which the peptic ulcer was demonstrated at a second or third operation, or at the post mortem. Eight of these 22 cases had shown absolutely no symptoms until suddenly perforation occurred. We may, therefore, conclude that in all probability a great number of cases escape detection.

We ought to bear in mind the possibility of peptic ulcer, whenever gastric disturbances recur after gastro-enterostomy. In fact, we should keep it in mind whenever gastro-enterostomy has been performed and regulate accordingly the treatment after the operation. The great immediate relief after such operations and the apparent immunity with which ordinary meals are digested, too often leads the surgeon to allow a liberal diet. It should be remembered that the chronic gastritis and the hyperacidity which accompany the primary ulcer, do not disappear immediately after operation, and that if not treated properly they may contribute to the development of new ulcers. The further surgical treatment of peptic ulcer following gastro-enterostomy has given very poor results. Complete recovery is rare; fatal issues frequent.

A careful consideration of all these facts should tend to restrict the indication for gastro-enterostomy, which otherwise gives such excellent results in certain benign gastric diseases.

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SOME OBSERVATIONS ON THE RELATIONS OF THE GASTRO-INTESTINAL TRACT TO NERVOUS AND MENTAL DISEASES.[1]

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As I have not the honor of being a member of the American Medico-Psychological Association, or even a neurologist, I assure you that I appreciate all the more the invitation of your secretary, my friend, Dr. Dent, to read a paper before you. I have selected as my title, "Some Observations on the Relations of the Gastro-Intestinal Tract to Nervous and Mental Diseases." You are all doubtless familiar with the investigations of Bouchard, Vaughan, Novy and Herter and many others, on the subject "auto-intoxication," and it must be evident to you that my remarks will be entirely based upon this theory. This field opens up enormous possibilities, and although much good work has already been carried on, I believe the subject to be really in its infancy. For your complete understanding, it would seem to me to be advisable first to refer to the physiology of digestion.

There are certain inorganic ferments contained in the bile, saliva, gastric juice, pancreatic juice and intestinal juice, which are a part of the human organism at birth. There are furthermore many organic ferments which are immediately acquired after birth, and which play an important part both in the physiology and in the pathology of the gastro-intestinal tract. At birth, this tract is sterile, as is confirmed by examination of the meconium. It is first infected in the new-born infant by the swallowing of air, and then with the bacteria of the food and the saliva. The feces of the adult and nursling contain bacteria to the extent of approximately one-fourth to one-third of the dried weight of the excretion—which would sum total many millions. With normal digestion, fermentation of the carbohydrates in the small intestines is produced by the micro-

[1] Read at the Sixty-first Annual Meeting of the American Medico-Psychological Association, at San Antonio, Texas, April 21, 1905.

organisms therein to a physiological degree, the organic acids, lactic and acetic, the derivatives of such fermentation, acting as a stimulus to normal peristalsis. These acids prevent the putrefaction of albuminates within the small intestines, and partly check the decomposition of the carbohydrates. The putrefaction of the albuminates physiologically takes place in the large intestine, the contents have an alkaline reaction. Here are developed skatol, which gives the odor to the feces, indol, phenol and various gases, and the other products of putrefaction. The *Bacillus coli communis* is believed to be an important factor in these putrefactive processes, and the production of indol depends largely on the activity. It is not a product of pancreatic fermentation as was formerly supposed. In this viscus also, a small proportion of fat is decomposed into glycerin and fatty acids, by the bacteria. When carbohydrates are present, as well as proteids, the colon bacilli ferment the carbohydrates first, and no indol is manufactured until this is nearly completed. Undoubtedly, putrefactive bacteria of various types are at all times present in the stomach and small intestines, but their activity is inhibited, until conditions favorable to their development arise. Thus normal fermentation of carbohydrates in the small intestine has this effect.

The first inorganic ferment which we find, is in the saliva, and this acts for the transformation of the carbohydrates. We must remember that proper mastication of the food, and care of the teeth, all have an important bearing on digestion. Acid fermentation in the mouth interferes with the action of the saliva, and, moreover, it has been demonstrated, that cleansing the mouths of nursing infants will, alone, diminish fermentative processes in the gastro-intestinal tract.

In the stomach we have the combined action of hydrochloric acid and the ferment pepsin on the proteids; the rennet ferment curdles milk and unless excessive hyperacidity be present, further fermentation changes occur in the sugars. Besides this, a small percentage of the fats is split into fatty acids. Meltzer has demonstrated that only a small quantity of water is absorbed from the stomach. Excessive hydrochloric acid, moreover, checks further changes in the sugars.

The motor functions of the stomach and intestines are of great importance. A small meal, such as a soft-boiled egg, a slice of toast and a glass of water, will pass through the stomach in about two hours; and at the end of this time, under normal conditions, only a small amount of gastric juice can be aspirated. About the same period of time, two hours, is consumed in the passage through the small intestines, and for about twenty hours, the final products remain in the large intestine before expulsion from the anus.

Normal peristaltic action of the stomach and intestines are, therefore, most important factors in the prevention of abnormal fermentation or putrefaction.

With atony of the stomach we have as a result motor insufficiency and stasis. It has been demonstrated that the presence of free hydrochloric acid, even in considerable quantities, does not prevent gaseous fermentation or putrefaction, if stasis be present. Simple atony of the stomach will often progress to chronic dilatation, and, in fact, I believe it to be a frequent course, if left untreated. With this dilatation, there may be increased fermentation or putrefaction. Butyric acid may be produced. This acid has a distinctly depressive effect on the central nervous system. Together with lactic and acetic acids, its presence indicates gastric stagnation, destruction of glandular elements by malignant or other disease, putrefaction or fermentation. Butyric acid is classified among substances acting as autotoxins. Hydrogen sulphide (H_2S) at times is found in dilated stomachs, together with other gases, the absorption of which cause toxemic symptoms.

In a recent work by Dr. Wm. H. Thomson, entitled "Graves' Disease, With and Without Exophthalmic Goiter," the author holds that gastro-intestinal toxemia is the cause of this disease, and describes some twenty-eight symptoms occurring in cases both with and without goiter. Curiously enough, ethylidenediamin, a ptomain found at times by Kulneff, in the liquids of the stomach, in dilatation of that organ, when injected into mice and guinea-pigs, will produce exophthalmos and some symptoms found in Graves' disease. This is of interest, and certainly suggestive. Mold in the stomach, hypoacidity, anacidity, chronic gastritis and achylia gastrica, may be found in dilatation of the stomach. It can thus be readily understood, how perversions of the gastric digestion may be a marked causative factor in the production of additional disturbances in the intestinal tract below, and be productive of excessive fermentation, or of putrefaction. A careful examination of the secretions and motor functions of the stomach is, therefore, one of the first requisites for scientific research into auto-infection from the gastro-intestinal tract.

Under normal conditions, when the chyme enters the small intestine, its reaction is acid, due to the hydrochloric acid contained therein. The bile is one of the chief factors in gradually altering this reaction to neutral or alkaline. It strongly supplements the action of the pancreatic juice in emulsifying fats and its absence, or diminution lessens this function. It, furthermore, precipitates the pepsin from the chyme, and allows it to be the more readily absorbed. Some consider that it has antifermentative and antiputrefactive powers, and that it helps maintain the nutrition of the epithelial cells. The bile exercises a distinct effect on the peristalsis of the intestines and certain noxious products are by it eliminated from the body.

The pancreatic juice contains an amylolytic ferment, a lipolytic ferment and a proteolytic fer-

ment, with which all are familiar. They act in a neutral or alkaline medium, though small quantities of acetic or lactic acid seem to favor their activity. The organic ferments, existing in the small intestine, aid in the production of these acids. According to Ewald, prolonged action of the pancreatic juice may produce hypoxanthin, but more probably it is due to excessive putrefaction. (Methyl guanidin results from the oxidation of creatin and creatinin and it illustrates how a comparatively non-poisonous substance may be changed into a violent poison by bacterial action. On injection of this substance into guinea-pigs there appear fibrillary twitchings, rapid respiration, dilatation of the pupil, dyspnea, labored breathing and clonic convulsions. All these phenomena are suggestive of epileptiform attacks. Creatin is found in muscle; creatinin, a derivative, is also derived from meat taken as food and appears normally in the urine. It is increased by meat diet, in diabetes, various fevers, such as typhoid, etc., and is diminished by anemia, etc.) Methyl guanidin results therefore from putrefactive processes in the small intestine and probably from the large intestine as well. This is a leucomain, which causes increased nervous irritability and tetanic convulsions, a fact of interest. During the process of normal amylolytic fermentation, organic acids are given off which are an aid to stimulating intestinal peristalsis, and these acids are of service in checking putrefaction. Peristalsis of the intestine also renders putrefactive changes less likely. Stasis of the intestine is an aid to putrefaction, just as is motor insufficiency in the stomach. Butyric acid and hydrogen sulphide are autotoxins, which may also be produced in the small intestines. The intestinal juice is claimed to augment the activity of the pancreatic ferments, according to Pawlow, and to help neutralize some of the acids formed by the fermentation of the carbohydrates. The reaction in the lower jejunum and ileum is acid. When the intestinal contents pass into the colon, the reaction becomes alkaline, fermentation stops, and putrefaction begins, and the fecal odor appears. In the large intestine great absorption of water occurs, the albuminates are taken up, as are also sugars and fats to a degree.

Marked auto-infection can occur from this viscus. Among the ptomains found after prolonged stasis are cadaverin and putrescin, which give the symptoms of muscarin poisoning. Moreover, indol, of which tyrosin is the chief source, is here developed. Herter has administered it to animals and observed cardiac and respiratory depression, marked contraction of the pupils, clonic spasms, and increased reflex irritability, Small quantities taken daily, for several weeks, produced nutritive changes, frontal and occipital headaches, colic, diarrhea, unnatural mental activity, and a tendency to the neurasthenic state. Indol is absorbed from the intestines, and forms indoxyl-potassium sulphate, or indican, and is so eliminated in the urine. The causes of indicanuria are excessive proteid diet, catarrh of the small intestines, causing alterations in the mucosa and increased intestinal putrefaction therefrom, typhoid, cholera, etc., constipation, alimentary putrefaction, decrease of normal digestive fluids, intestinal obstruction and peritonitis. Certain drugs, such as salol, salophen and creosote will cause its appearance, whereas urotropin will diminish it.

Regarding the urinary test for this condition, Jaffe's is the one frequently employed. Rosenbach's test, which consists in boiling the urine with nitric acid, gives a Burgundy-red. This also demonstrates putrefactive changes, but not invariably that indican is one of the elements. This sometimes occurs when no indican is found by Jaffe's test. The result is due to substances of a like class. Other conditions of the urine occur as a result of these toxemias from the gastro-intestinal tract, the appearance of albumin and casts, or diminished urea excretion. The kidneys may become damaged from these toxins, and in turn, toxemia from the kidneys may result. We must remember that absence of indican in the urine does not invariably indicate absence of putrefaction, as in diarrhea, the indol may be to a great extent eliminated. In some cases even when constipated, there are no evidences of indican, even when there are clinical signs of abnormal putrefaction. This demonstrates that there are other putrefactive substances besides indol. Finally the functions of the liver and its relations to toxemia must be briefly considered. We have already described the action of the bile in the intestines. The liver acts as a store-room of the organism, for peptones, and sugars in the form of glycogen, these substances being kept there until their final use in the system. It excludes poisonous matters from the general circulation by removing them from the portal vein and excreting them by the bile. Thus, Herter demonstrates that the liver is the chief organ for the removal of indol. Various poisons and other toxins, as of typhoid, etc., are similarly destroyed, or chemically changed. Therefore, any diminution of the functional mass of the liver, or interference with its functions, impairs this property and toxemia results.

The bile itself, when absorbed into the system, acts as a poison, and produces a definite toxemia. Moreover, catarrhal conditions of the intestines will often cause obstructive jaundice; or the colon bacillus may become a source of infection of the ducts and gall-bladder. Insufficiency of the biliary secretion, or the absence of bile from the intestinal tract, favors in turn those conditions which result in auto-intoxication—due to the induced obstinate constipation, from the absence of its antiseptic and peristaltic stimulant effect, and we have the well-known symptoms of bilious indigestion. You are all familiar with the slow pulse, and other symptoms of jaundice, unquestionably due to auto-intoxication.

Cholin, under normal conditions, is found in

the bile as well as in the blood and brain and, in intestinal disorders its amount is increased and it may appear in the urine. In dilute watery solutions it may be transformed into neurin which is still more toxic. Large doses of cholin cause nearly instantaneous death in cats and rabbits. In experimental poisoning, there are dilatation of the peripheral blood-vessels, lowering of the blood pressure, salivation, spastic contractions and stoppage of the heart in diastole. It is an important factor in auto-intoxication on account of its relation to nervous disorders. Nerin, a derivative of cholin, on injection into animals, causes dyspnea, salivation, mydriasis, irregular and labored respiration, unconsciousness and clonic convulsions. Muscarin is believed to be often associated with cholin and it also causes convulsive seizures. It is also found in mushrooms and in decomposing fish. All these substances produce epileptiform seizures.

It is interesting to note that hepatic disease may be produced experimentally by substances allied to the autotoxins, thus in the production of hemoglobinemia by the injection of free hemoglobin, or of distilled water, jaundice is produced. Furthermore, poisons circulating in the blood cause a change in normal bile, in which it increases in viscidity, causing agglutination of the walls of the bile ducts, obstruction of their lumen, and consequent retention of bile within the sac. Stadelmann was able to produce a jaundice experimentally in animals by poisoning them with arsenureted hydrogen and toluenediamin, and found that there was an enormous increase in the biliary secretion, and that it was very thick and tenacious. Autopsies showed no catarrh of the duodenum, nor obstruction of the common duct. Moreover, the bile acids, if injected, cause disintegration of the red blood corpuscles, with liberation of hemoglobin. They delay the coagulation period of the blood, and reduce motor and sensory irritability, and may cause coma, insensibility and death.

It is evident, therefore, that the liver cannot produce normal bile from abnormal blood; and the fact that jaundice is caused by exposure to cold, syphilis, typhoid, phosphorus and other poisons, shows how easily the secretion of the bile is altered, and suggests that intrinsic poisons, which are often hemolytic in their action, may act a causes. Toxic materials absorbed from the intestinal tract, or from the urinary tract, in addition, may cause altered secretions, and the retention of bile from its own viscosity may ensue. The absorption of bile is, therefore, a serious complication, when surgical operations are necessary, owing to the increased danger of hemorrhage on account of the lengthened coagulation period. In fact, hemorrhages from the various organs at times ensue, even subcutaneous in character; a condition like purpura hemorrhagica. For this condition, large and frequent doses of calcium chloride have been recommended. Moreover, the toxemic condition causes these patients to take anesthetics badly, and renders them liable to shock and collapse, and they have little resistant powers against sepsis and disease.

Having thus described the relations of the gastro-intestinal functions to toxemia, at this point I wish to call to your attention several important propositions: (1) that epileptiform seizures, or even true epilepsy, may in some cases result from auto-infection; (2) that in many cases of nervous or mental diseases, derangements of the gastro-intestinal functions with resulting auto-infection may aggravate the original condition from which the patient may be a sufferer, and thus create a vicious circle; (3) that it is our duty as physicians, as much to our poor asylum, as to our private patients, to place them in the best possible physical condition.

And, finally, that on the patient's admission to such institution, a thorough investigation should be made in each individual case, into the existing conditions of the gastro-intestinal tract, and appropriate treatment be instituted in each; for by this means alone, can a scientific study of the relations of toxemia to nervous and mental diseases and the results of treatment be obtained. My friend, Dr. Dent, is the first one to appreciate the value of this method; and, as I shall describe to you later, it has already been instituted at the Manhattan State Hospital, West, Ward's Island.

I shall first consider epileptiform convulsions and epilepsy, resulting from toxemia from the gastro-intestinal tract. I judge that you are all familiar with the fact that the carnivora are susceptible to convulsive seizures from dietetic disturbances, whereas the herbivora are exempt. It is, furthermore, interesting to note, that the administration of meat to young dogs will often be productive of convulsions. The intestinal walls of infants permit the passage of proteids, whereas those of adults do not, which may account for the greater frequency of nervous manifestations in children. Moreover, red meats in every event tend to aggravate nervous conditions, and it is customary, in the modern treatment of epilepsy and in many nervous diseases largely to eliminate them from the dietary. I have, furthermore, noted in my own cases of epilepsy resulting from toxemia, that the patients were large eaters, especially of the red meats.

Some thirty years ago Meynert attributed epilepsy to the accumulation of a toxic substance of a proteid nature. The convulsive element is very prominent among the various autotoxins developed in the intestinal canal, notably with hypoxanthin poisoning, with methyl guanidin and with neurin, the symptoms of which we have already described. The studies of Ceni on epilepsy also demonstrate that it is of autogenous origin and the fact that no immunity occurs from repeated attacks and that the serum which he devised has no inoculatory power shows that the process is not bacterial in its nature. It would seem, as will now be demonstrated, that certain cases at least must have as their source, auto-

infection from the gastro-intestinal tract. I shall first consider epileptiform seizures in the young.

In our study of convulsive seizures in infants and young children, resulting from the administration of improper food, or from overloading the stomach, it was possible to distinguish two classes of cases—gastric and enteric. In the gastric cases, the convulsive seizures come on a short time after the administration of food, half an hour to an hour, or even less, and emesis often produces immediate relief. I have noted acute dilatation (distention) of the stomach in these patients. Just as in adult cases, to which I shall shortly refer, I believe, this acute dilatation, to be caused by auto-infection, resulting from fermentative or putrefactive processes in the stomach. Such attacks, continuously repeated, may predispose to the convulsive habit, and become a factor in the production of epilepsy. Furthermore, repeated attacks may tend to render the stomach atonic, and may result in chronic dilatation, with chronic toxemia as a result. I have referred to this class of cases in my article, entitled "Observations on Dilatation of the Stomach on Gastroptosis," MEDICAL NEWS, August 6, 1904. In the enteric type, the convulsions occur several hours after the administration of food, and are relieved by the use of an enema. These result from toxemia from the intestinal canal. Castor oil or calomel should then be used as adjuvants.

We may have, instead of these well-defined types, a combination of the two. Holt and many others believe that intestinal putrefaction, exciting convulsions in young children, is an important factor in the production of epilepsy. Repeated convulsions certainly predispose to the convulsive habit. On the other hand, chronic dilatation of the stomach in the young, may result from improper feeding and the products resulting may be a cause of toxemia from the stomach direct, or after entrance into the intestines. A condition of chronic toxemia may thus result. As a matter of interest we would note that rickets, which is considered one of the factors in the production of epilepsy, has often associated with it chronic dilatation of the stomach. Furthermore, Bouchard, in his well-known work on "Auto-infection," lays great stress on the chronic toxemia resulting from chronic dilatation of the stomach. I am thoroughly convinced that many cases of disturbances of the nervous system, chorea, so-called idiopathic epilepsy, and other nervous conditions commencing in early childhood, can often be justly imputed to this type of chronic toxemia. Derangements of the liver and renal functions are often associated, or result from gastro-intestinal disturbances, and take an active part in the toxemic process. Fortunately, beneficient Nature steps in in many cases, and the toxins are eliminated, with no permanent harm to the patient; while other cases may suffer from continual absorption, from prolonged constipation, for example, without any symptoms whatsoever. There is a great difference in the individual.

I should now like to call to your attention some interesting data regarding epileptiform attacks in adults. Mangelsdorf, of Bad Kissingen, has examined over four hundred cases of epilepsy and several hundred cases of migraine, and has found acute dilatation of the stomach, just preceding or during the attacks. He made accurate drawings, in many cases, of the extent of the dilatation. Another interesting type, is gastric tetany, in which gastric dilatation is a factor. Smith[1] reports a case in which a patient with dyspepsia and gastro-intestinal flatus failed rapidly in strength, and became troubled with insomnia. Tetanic attacks occasionally occurred, in which the fingers were forced into the palms. There was trismus, and the wrists were extended and rotated outward. The patient suffered mentally, and sleep was disturbed by spectral delusions. The stomach was found to be dilated, and in a condition of ptosis, and the patient became eventually extremely asthenic. These recurring attacks were entirely relieved by lavage and non-nitrogenous diet, but when these measures were neglected, symptoms at once showed themselves. Dujardin-Beaumetz[2] reports a case of gastric dilatation with very similar symptoms; and Strong[3] describes seven cases, characterized by spontaneous intermittent muscular contractions, and remarks their similarity to epilepsy. Simpson[4] and Kussmaul[5] find tetany a fairly common accompaniment of dilatation of the stomach. Moynihan[6] believes it to be not very rare, and what is of extreme interest, reports five cases in which gastro-enterostomy was performed, with a resulting cure in each case. This is most significant, as thorough drainage of the dilated stomach, the source of auto-infection, was removed and the patients were cured. The brilliant surgical work of Mayo among the nervous and insane is doubtless familiar to you.

I believe that, in certain cases of marked dilatation, or ptosis of the stomach with resulting auto-infection, the field of surgery will in the future play an important part for the relief of nervous and mental diseases. Bouveret,[7] Ewald,[8] Fleiner,[9] Einhorn,[10] and many others have reported cases of gastric tetany. Amato[11] reports a case of gastric dilatation with tetany, resulting in death. He has introduced fermenting materials into the stomachs of animals, and produced dyspnea, myosis, muscular contractions and trismus. The liver and pancreas (post mortem) showed lesions such as are usually found in poisonings and intoxications.

An interesting case of catalepsy, associated with tetanic spasms, has been reported to me by Dr. John C. Minor, of New York. The patient suffered from chronic dilatation of the stomach with ptosis of the organ. Following an attack of constipation, or marked indiscretions of diet, she would suddenly become absolutely stiff, with flexion of the limbs, the eyes tightly closed, and

would remain unconscious for a number of hours. From this condition, as she emerged into consciousness, the feet would extend, the knees increase in flexion, and there would be spasmodic twitchings of all the limbs. Between attacks, the bowels would remain extremely loose, there being many watery movements during the day. As the attack was wearing off, watery movements would occur—as many as twenty in number. While the patient's bowels remained loose, no attacks would occur. A contributing factor to the gastro-intestinal disturbance was believed to be morphine, of which the patient at times took considerable quantities.

Epilepsy, without question, may be in some cases directly attributed to auto-intoxication from the digestive tract. In the *Medical Record*, January 28, 1905, appears an interesting article by Dr. Wm. P. Spratling, Medical Superintendent of the Craig Colony for Epileptics, entitled "Gluttony, or Food Poisoning, as a Cause of Symptomatic Epileptic Convulsions." I quote as follows: "The first few cases of symptomatic epileptic convulsions that I saw in middle-aged men, in which convulsive attacks invariably followed gross overindulgence in eating and drinking, did not impress me as constituting a class of sufficient importance to warrant their being placed in a group alone. But having seen 18 or 20 such cases during the past two years, I have come to believe that they represent a distinct phase of the subject that is well worth calling special attention to, particularly since they are usually so amenable to treatment; substantially all of them making satisfactory recoveries when treatment is promptly instituted and observed as long as the nature of the case requires.

"The cases of this kind that do not turn out well under treatment are those in which the patient is unwilling to deny himself the pleasures of the palate, except spasmodically and immediately after he has had a convulsion. But unfortunately the lesson learned at such times, is soon forgotten, and all such individuals stand in danger of ultimately becoming confirmed epileptics of the so-called 'habit' type, and to suffer all the mental and physical accompaniments of that affliction.

"Usually those who suffer in this way are between thirty-five and forty-five years of age. Most of them are men of robust, frequently plethoric physique; all are hearty eaters; all lead more or less inactive, indoor lives, and some are heavy drinkers. When the latter factor complicates the case, the prognosis is less hopeful than when there is excessive food consumption only; not because the type of convulsions induced by alcoholic indulgence yields less easily to treatment, but because the drink habit is not so readily broken.

"While it is true, as a general rule, that heredity plays but little part in the causation of epilepsy, when it originates anew after the twentieth year, I have found that it is quite frequently a factor of some degree in the cases in question. It seems that there need not be insanity, or alcoholism, or epilepsy, or some other nervous affection in the ancestors of such cases as these, but a stomach disorder of pronounced type, like an aggravated dyspepsia, may make its influence felt in some obscure way in the offspring.

"A very intelligent professional man, forty years of age, came under my care eight years ago. He was subject to symptomatic grand mal attacks that invariably appeared the day following gross dietetic indiscretion, such indiscretions usually occurring between midnight and 2 A.M. He had a weak stomach and could digest certain foods only. On investigation I found that his father suffered the better part of his life in the same way. The father respected his nutritional peculiarity, but the son did not; so the father escaped anything more serious than a severe, periodic dyspepsia; while the son was threatened with becoming a confirmed epileptic. After having an attack while speaking in a public hall once, he realized his danger, changed his manner of living, and had been free from attacks for five years when I saw him last on November 24, 1904.

"The primary cause of convulsive attacks in cases of overeating and overdrinking in certain individuals seems to lie, first, in a weak stomach, and, second, in some obscure disorder of metabolism. Not only is the amount of food habitually taken by such persons beyond all reasonable requirements, but it is usually of an improper kind, and is taken to gratify what seems to be an abnormal appetite.

"The type of convulsion usually induced is of the *grand mal* variety, though it is not definitely fixed. So long as the attacks remain *grand mal* only, the case is less likely to pass into 'habit' epilepsy than when the type changes. The last case of the kind I saw was that of a newspaper man, thirty-eight years of age, who suffered *grand mal* attacks for some years, but whose dietetic habits were so atrocious that the seizures at the end of that time changed to infrequent *grand* and very frequent *petit mal*, with the result that some mental enfeeblement is becoming apparent, his memory in particular. This annoys him painfully, for in his work a good memory is a necessity. Along with the change in the type of his convulsions have come periods of marked automatism.

"The day before I saw him he had a breakfast of cereals, eggs, fried potatoes, pancakes and coffee; a hearty dinner at noon of a rich soup, chicken pie, several vegetables and pudding, with wine sauce for desert; for supper he had a heavy meat pie, of which he ate heartily, three large baked potatoes, three pieces of apple pie, and three cups of tea; and yet he wondered why he suffered so much from headaches, from his stomach, from eructations of gas and flatulence, and attacks of momentary unconsciousness that

were increasing in frequency, and that, worst of all, were fast undermining his mental faculties. He had written me two letters within a week, one on the day before I saw him, and yet he could not recall my name when I met him.

"While the indications for treatment in such cases are plain enough, they are not so easily carried out. The cause of the convulsions must be sought in toxic states due to faulty metabolism. We must first eliminate waste and toxic products, and then plan a course of treatment which will prevent a recurrence of such products."

In a number of cases of epilepsy, during the past few years, Dr. Wm. H. Thomson has secured brilliant results with the cure of patients, from treatment of the gastro-intestinal tract. In a few instances, gastric analysis showed hyperchlorhydria, while in a number of cases there was hypochlorhydria, with or without gastric dilatation. The treatment consisted in avoidance of red meats, intestinal disinfectants, regulation of the bowels, diet and medication suitable to the individual condition of the stomach, and, temporarily, sodium bromide, combined with antipyrin, to lessen reflex irritability and break the convulsive habit. I have treated recently several interesting cases of epilepsy, which were unquestionably due to auto-infection from the digestive tract. Time, however, will only allow me briefly to refer to one case.

A young man, aged twenty-five years, with a negative family history, came to me for treatment, having had epileptic attacks for about six months. About a year previous to this, he had been in the Philippines, where he had a severe attack of dysentery. Since that time he has been troubled with occasional mucous discharge from the bowels. For some monhts past, however, he had been constipated, belches gas from the stomach, and has water brash and a sour taste in his mouth; the tongue is coated. The gastric symptoms are more marked before his attacks. He has averaged one attack a month for four months, and during the last two months has had seven attacks. The early attacks were between 7 and 10 P.M., but more recently they have been from 4 to 7 A.M. The attacks clearly followed extreme indiscretions in diet, and the mother of the patient (who is a trained nurse), sent him to me for treatment, believing that gastro-intestinal disturbances were the factors in the case. In the early morning attacks, he would be awakened by abdominal discomfort, then the hands would begin to twitch, the wrists and arms would flex, then these would be raised automatically to the level of the head, and he would then become unconscious. The tongue was bitten during a number of the attacks. Examination of the stomach contents showed: Total acidity 120 + free hydrochloric acid, 90 +, a condition of hyperchlorhydria. There was intestinal tympanites, and some odor to the stool. Constipation was marked. The patient was shut off from red meats, smoking and drinking, and placed on a simple diet, especially a light supper. The bowels were freely opened with calomel, and thereafter kept carefully regulated. He was given benzoate soda gr. x t.i.d. for the intestinal putrefaction; and soda bicarb. gr. x to xx t.i.d. an hour after meals for hyperacidity. Soda bromide gr. x four times a day, one of the doses at bedtime, was given to break the convulsive habit. This treatment was continued, but the bromide was gradually diminished, and then finally stopped entirely. For four months he had no attacks. He then ate a large amount of candy during the afternoon and evening, and promptly had an attack early the next morning. Calomel was given, and bromides were begun again, and in a few days dropped. During the next three months, he had three attacks, all following indiscretions in diet, and since then has been perfectly well—a period of ten months so far, by merely taking gastro-intestinal treatment and exercising care in diet. This case would seem to be of interest.

I have noted several other cases, where there was hyperchlorhydria with atony of the stomach, and a number with hypochlorhydria and dilatation.

The question of the etiology of epilepsy is of so great interest, that Dr. Wm. H. Thomson has instituted a general research on the subject at the Manhattan State Hospital, West, Ward's Island, in which in each epileptic patient the organs of the body are examined by the various specialists who visit this institution and abnormalities, if present, are corrected. By this means, we hope in time to secure some very valuable data. In Book I (which I pass around for your observation), you will see our gastro-intestinal history sheets for these cases. These are very complete. Appropriate medication is given, such as may be indicated in each case, antacid or hydrochloric acid mixtures. The bowels are carefully regulated, and lavage is employed, if required. Intestinal antiseptics, such as benzoate of soda, resorcin, soda salicylate, and sulphocarbolate of soda are given. The red meats are omitted. Bromide of soda, with antipyrin, is administered, to lessen reflex irritability and break the convulsive habit. Matzoon is made in the hospital especially for these cases. These patients live as much as possible in the open air, a method which Dr. Dent carries out in fact with all his cases in the hospital.

You will kindly observe the photograph I now pass around for inspection. It demonstrates the position of the stomach in epileptics recently examined. The anatomical regions were marked out in blue pencil on the abdomen of each case and during transillumination of the stomach the outlines were drawn in colored pencil. These markings were redrawn directly from each subject, on paper stamped with a special instrument, giving the anatomical regions. The results secured were as follows: Females, total number,

34 cases; gastroptosis, 16; dilated stomachs, 16; stomach in normal position, 2. Males, total number, 6 cases; dilatation of the stomach, 5; stomach in normal position, 1.

The motor functions of the stomach were examined and the analysis of the gastric contents were made with all these patients. These factors were considered in making the diagnosis. There was abnormal secretion in the stomachs occupying the normal position. These data are certainly suggestive. There has been improvement in some of these cases, but it is too soon to report definite results. Of course, many of these asylum patients are of the worst type, and in some, degenerative changes have occurred in the brain. Nevertheless, even under such conditions, auto-intoxication can be minimized and susceptibility to convulsions can be diminished by proper treatment.

These stomachs were transilluminated with the gastrodiaphane and fluorescein solution. On Card "A" you will see a picture of the new "circumscribing gastrodiaphane," which was especially devised for work in this hospital. On Card "B" is a description of the various fluorescent media employed, also a new method, and devised by the author at this institution.

There seems to be an unfortunate disposition on the part of neurologists to consider various gastro-intestinal disorders, dilatation of the stomach, inordinate appetite, stuffing, bolting the food, etc., to be the result of nervous or mental disease. They forget that bulimia (inordinate hunger soon after a meal), acoria (absence of satiety), polyphagia, etc., are often found in stomach diseases. I think that we have, even at this point, fully demonstrated that, in some cases at least, the gastro-intestinal disturbances may be primary.

You are all familiar with the symptoms resulting from chronic constipation such as headache, drowsiness, inability to concentrate the attention, general malaise, etc. Duprey, in the *Lancet*, 1902, I, 1832, cites the following interesting cases illustrating extreme types of toxemia as a result of this condition:

Case I.—A woman of thirty-five years suddenly became unconscious with rapid and shallow breathing, pulse 96, temperature normal. Examination of the urine showed no signs of nephritis, attention to the bowels was followed by recovery.

Case II.—A young man suddenly became unconscious, but could be roused from his stupor only to talk incoherently and relapse into the unconscious state. Heart, lungs and kidneys were normal. Recovery after free evacuation of the bowels.

Case III.—A child, three years old, with a history of constipation, suddenly expired while playing. Autopsy showed no condition which could account for death except that of fecal distention of the descending colon. Some on the other hand have no symptoms resulting.

Many nervous conditions, neurasthenia, mental depression and melancholia, can be imputed to auto-intoxication. Brokers and professional men, with irregular habits of life, constitute almost a class in themselves. Bolting the food, or excessive eating or drinking, rich food, etc., are factors in the production of hyperacidity, motor insufficiency, dilatation of the stomach, constipation, and auto-intoxication, with resulting disturbances of the nervous system, and the treatment of the gastro-intestinal conditions will rapidly restore the patient's nervous tone in many cases. Mental depression often accompanies, or is a symptom of, toxemia, and this condition may even progress to depressive insanity. Among other symptoms of auto-infection from the digestive tract, are apathy, insomnia, somnolence, and inability to concentrate the attention. Resulting from the auto-intoxication of jaundice, we may have all grades, from mental depression to melancholia and insanity. It may cause coma, muscular twitchings, convulsions and death. Stern [12] reports a case of narcolepsy in which, having excluded syphilitic endarteritis, he imputes the condition to auto-infection, resulting from dilatation of the stomach and hyperchlorhydria.

Hamilton[13] offers the following conclusions, having made a special study of the digestion and urine in the insane: "Varying and fugaceous illusions and hallucinations, pallor, increasing exhaustion, verbigeration, confusion and unsystematized delirium, are due to auto-intoxication.

Auto-intoxication is common in alcoholism and the drug habits. Epileptiform attacks are directly connected with putrefactive conditions in the intestines." An interesting condition, resulting from auto-intoxication, is Graves' disease. I have already referred to the work of Dr. Wm. H. Thomson, "Graves' Disease, With and Without Exophthalmic Goiter." He holds that the toxin is formed first in the alimentary canal, and then remains in the circulatoin on account of disturbance of the thyroid. He describes twenty-eight characteristic symptoms. Many cases of true Graves' disease exist without thyroid enlargement. He believes that implication of the thyroid is secondary, just as is the enlarged spleen in some cases of chronic ague. He has secured some brilliant results by treatment of the gastro-intestinal tract. I have already referred to the suggestive fact that ethylenediamin, a ptomain, found in some cases of dilated stomach, will produce exophthalmos on injection into animals.

Another interesting class of nervous cases, resulting from auto-infection, are those in which ptosis of the gastro-intestinal tract is the primary factor. There are various types of this condition, from those of a mild degree to the extreme condition described by Glénard. With the descent of the stomach and intestines, there is a nephroptosis of the right kidney, sometimes of both, and there may be, in addition, ptosis of the liver and spleen. A review of the etiology is necessary.

In the first place, the vertical stomach is the fetal position of the organ. Examination of infants and of young children will demonstrate, occasionally, a congenital gastroptosis to exist, and in some cases gastroptosis with its associated enteroptosis has been accidentally discovered and has undoubtedly existed for many years, with no symptoms resulting, the patient being in perfect health; but some contributory factor, local irritation, anemia or intercurrent disease may destroy the equilibrium, and gastro-intestinal disturbances, constipation, etc., occur, causing auto-infection, and as a result, neurasthenia. The maintenance of a certain degree of intra-abdominal tension is a factor in preserving the position of the viscera; thus a loss of tone in the abdominal muscles, or absorption of omental, or intra-abdominal fat, may be a factor in the production of ptosis. So also may an abnormal elongation of the mesentery, or an atonic condition of the suspensory ligaments of the stomach and colon. The loss of tone in the stomach and intestines—atony—is another factor in the production of ptosis. I have always believed dilatation of the stomach and gastroptosis to be progressive degrees of atony; that in ptosis of the stomach, the organ was dilated and that gastroptosis might be primary, with enteroptosis a secondary condition; this agrees with Riegel's views. I cited a case in which I was convinced dilatation first occurred, then gastroptosis, and later enteroptosis. Glénard, on the other hand, claims that enteroptosis is invariably the primary condition. The conditions are undoubtedly associated, but I believe that either may precede the other.

It is not the degree of the descent of the lower border of the stomach which constitutes a ptosis. With gastroptosis, the lesser curvature of the stomach descends with the greater and loses its relations to the diaphragm; while in dilatation, the muscular fibers elongate in the vertical direction—the greater curvature alone sinks, and the lesser curvature maintains its relations and does not sink.

The gastric condition may be one of hyperchlorhydria, or of hypochlorhydria, or even achylia gastrica. If the splashing sound be confined to below the umbilicus, and to the left of the median line, and one can determine a floating kidney, we can be sure that gastroptosis is present. In the milder degrees of ptosis, it is not so easy to differentiate between ptosis and simple dilatation; and in this event it may be necessary to employ inflation with air, or transillumination of the stomach.

Undoubtedly many cases of neurasthenia, treated with brilliant results by the Weir-Mitchell rest cure, are the result of gastroptosis. Rest and the putting on of fat to increase intra-abdominal tension are of value in ptosis. Rose's adhesive plaster belt is of service in the treatment of these cases, as it supports the organs and increases intra-abdominal tension. I show you a manikin with the belt applied, and also the plaster-strapping ready cut for use. At the Ward's Island Clinics, we were the first to employ the moleskin plaster for the belt. The zinc oxide on moleskin, 7 inches wide, and manufactured by Johnson & Johnson, is the best for this purpose. In a new work, entitled "Atonia Gastrica," by Dr. Rose and myself and published by Funk & Wagnalls, you will find a full description of the method.

I consider mucous colic to be one of the manifestations of Glénard's disease, and the neurasthenic condition present in the disease, to be the result of auto-infection. These views are given in a paper, entitled "Mucous Colic," *American Medicine*, March 4, 1905.

In conclusion, let me say that many cases of neurasthenia occurring in women are due to auto-infection, associated with ptosis of the viscera; and I have seen excellent results secured from the treatment of the latter condition. In extreme cases, surgical measures, such as revision of the abdominal mucles, with shortening of the suspensory ligaments of the stomach, or gastroplication, as suggested by Dr. Robert T. Morris, would be of value. I have already called to your attention that auto-infection from the gastro-intestinal tract may, in many cases, even when there are organic changes in the brain, create a vicious circle and aggravate the symptoms.

Such derangements of the digestive functions occur in syphilis, from alcohol and from drug habits, as well as in other conditions. For example, I present the following data to you of thirteen cases of dementia paralytica, investigated by Dr. Dent. You will note a diminution in the frequency of the convulsions, and a lowering of the temperature in these cases, resulting from regulation of the bowels and treatment of the gastro-intestinal tract, appropriate to each case.

Dementia Paralytica (Analysis of 13 cases).—Tabetic type, 4 cases; cerebral type, 1 case; hyperacidity, 1 case, with dilatation of stomach slight and commencing; achylia gastrica (functional), 1 case; hypoacidity, 11 cases, with two severe types of chronic gastritis; dilatation of stomach, 11 cases; gastroptosis, 2 cases; chronic constipation, marked and of varying degrees of severity, 13 cases; odor to breath, 13 cases; evidences of putrefactive changes in the gastro-intestinal tract, 13 cases; temperature, no result from treatment, 2 cases (in one of these the temperature was due to foul bed-sores); temperature lowered in 11 cases, and in some very decidedly as a result of treatment, and remained lowered (rectal irrigation was an aid in lowering the temperature in 3 cases); convulsions, none occurred at any time in 7 patients; diminished in frequency in 5 patients by treatment; attack of syncope (equivalent to convulsive seizures), absolutely stopped by treatment, 1 case; died, 1 case.

In Book II, you will find abstracts of each case, with a photograph of the stomach. The data are tabulated on the cover. As intestinal irrigation proved of value in 3 cases. I show you the Kemp irrigating tube (recurrent), which is of service

for the purpose. The outflow is curved and larger than the central flow. It is employed in all of our large hospitals. The continuous bath, as advocated by Dr. Dent, is of great value as a sedative and to eliminate toxins.

Surgery.—I have already called to your attention the brilliant results secured by Moynihan in gastric tetany, through drainage of the dilated stomach by gastro-enterostomy, and hence the prevention of auto-infection, and the cure of his patients. The work of Mayo has also been alluded to. I have spoken of the value of surgical procedure in mucous colic, with its associated neurasthenia. In some of our patients suffering from nervous or mental diseases, with marked dilatation of the stomach and auto-infection, I believe that we should resort to gastro-enterostomy, or gastroplication, after failure of the simpler measures. It will relieve the toxemia and break the vicious circle, thereby ameliorating symptoms, even in the worst type of cases. A case of gastroptosis and dilatation, with nephroptosis of the right kidney, the patient being melancholic, was recently operated on at the Manhattan State Hospital, West, Ward's Island, by Dr. Bickham. There was albuminuria, and congestion of the kidney, and the patient's attention was directed to that organ. I advocated that a nephropexy should be first done, to relieve the existing congestions and for the mental effect.

If mechanical support by Rose's belt and medical treatment of the auto-infection do not relieve the nervous symptoms, gastroplication and shortening of the suspensory ligaments of the stomach will be performed. I believe that in some cases in surgery, we have a brilliant future for the relief of nervous and mental diseases, especially in the types mentioned. The work of Dr. Leroy Brown in his department, gynecology, speaks for itself. Finally, since auto-infection from the gastro-intestinal tract would seem to have such an important relation to these conditions, a new method has been instituted at the Manhattan State Hospital, West, Ward's Island, which I will now describe.

In Book I, on the last page you will observe a gastro-intestinal chart for new cases. I insert a copy of it in next column. On this is placed the mental diagnosis, and also the gastro-intestinal condition found by examination. At the bottom of each chart, a memorandum is made of the treatment and the results. This is bound in with the history of the patient. A duplicate is filed separately, so that at any time, under the various types of nervous or mental disease, we can find the conditions existing in the gastro-intestinal tract, and the treatment employed with the results secured, without reading through the histories of the cases. A special physician is appointed to examine each case on admission, and appropriate treatment is at once instituted. We have certain standard mixtures at hand, an acid hydrochloric mixture with pepsin, and antacid mixture (magnesia usta 3 parts, soda bicarb. 1 part), and an antifermentative mixture (resorcin gr. v, benzoate soda grs. x, sulphocarbonate of soda grs. iii.) Lavage is performed when required. Special cases, such as ulcer of the stomach, etc., are referred to the visiting gastrologist. The bowels are regulated, and hydrotherapy (for which there are all the modern facilities) is applied when indicated. In Book I, I have appended a brief history of a case kept for five weeks in

MANHATTAN STATE HOSPITAL, WEST, WARD'S ISLAND.

Name Age, Ward,
Date,

Diagnosis
Acute Melancholia.

GASTRO-INTESTINAL CHART.

Diagnosis
Stomach

Percussion			Normal Position
			Atony
Splashing Sound			
Palpation			Dilatation
Nephroptosis			Gastroptosis
Vomiting			
Ewald's Test Breakfast			Residuum Aspirated c.c.
Reaction	Total Acidity		Free HCl.
Uffelman's Test	Pepsin	Rennet	Starch Digestion
Mucus	Blood	Hyperacid	Normal
Anacid	Achylia	Gastritis	Fermentation
Liver			
Intestines		*Spleen*	
Percussion			
Palpation			
Movements			
Normal	Irregular	Constipation	Diarrhea
Mucus	Blood	Odor	
Enteroptosis			
Treatment		*Results*	

a continuous bath. By such means, the influence of auto-infection from the gastro-intestinal tract on each patient is carefully observed. Complete urinalysis, estimation of urea—the presence of indican, etc., is carried out in every case. To my knowledge, this is the first institution in this country which has placed the study of the relations of auto-infection to nervous and mental diseases on a practical clinical basis; and it is from such investigations that we secure results from the science of medicine, and the greatest benefit to suffering humanity.

107 East Fifty-seventh Street. New York City.

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Dental School's New Site Bought.—The purchase of a new site for the Harvard Dental School, to be located near the medical school in the Fenway, was the pleasant announcement which Dean Smith made to the alumni of the school at a recent reunion and dinner. Dean Smith also made an earnest appeal for a fund of $500,000, for the erection of a suitable building, and an appropriate endowment, on the ground that the school was really a charitable institution and carrying on a strictly charitable work throughout Boston and vicinity.

SYPHILIS OF THE LIVER, SCLEROGUMMATOUS TYPE.[1]

BY JOHN FUNKE, M.D.,
OF PHILADELPHIA;
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ALTHOUGH Fischer[1] maintained that syphilis produced five different lesions in the liver, yet he recognized that the forms are not easily separated from one another. The classification given by Virchow[2] is the one usually accepted. He maintained that syphilis may affect the liver as a diffuse process or as a gumma, or these two may be combined, giving us a sclerogummatous form. Frerich[3] recognized a waxy or amyloid type but this has been excluded by Virchow. It is the sclerogummatous form that will be dealt with here. This paper is based upon a liver obtained at autopsy at the Philadelphia Hospital. The pathological diagnosis was as follows: Chronic ulcerative tuberculosis of the lungs; hyperplastic pleurisy; fibroid myocarditis; hyperplastic splenic capsulitis; chronic interstitial nephritits; miliary tuberculosis of the liver.

Since no lesion in other organs bears upon the matter under consideration the post-mortem findings of the liver and the gall-bladder only will be given. The liver lacked 1 cm. of reaching the costal margins in the midclavicular line, it was slate-colored but had a distinct greenish tinge; the organ was firm and scattered over its external surface were many round or oval grayish areas, varying from 2 to 4 mm. in diameter. They were apparently beneath the capsule which seemed involved, as was clearly shown by section; when incised they were found to extend into the parenchyma of the organ, so far as could be determined, to a distance of about 2 to 4 mm. Over the external surface 5 cm. to the right of the suspensory ligament were two depressed grayish-white lines running nearly parallel with that structure; they were both 4 mm. in width; one measured 2.5 cm. in length and the other 1 cm. The organ was found to resist the knife and the cut surface was studded with nodules similar to those described as being present under the capsule. They resembled miliary tubercules in every respect, although it was quite impossible to remove what appeared to be caseous centers. The peripheries of many of the lobules were easily outlined and were slightly depressed; the depressed parts were grayish-white in color and resembled fibrous tissue. The greenish tinge was more pronounced on the cut surface than upon the external portion of the organ, giving the parenchyma a granular appearance. Near the transverse fissure of the organ was a fibrous mass having a dimension of 1 by 2 cm., which incorporated the bile passages but did not impinge upon the vessels. A probe introduced at the ampulla of Vater would extend as far as the juncture of the hepatic and cystic ducts, where it met with an obstruction and upon dissection of the common duct the lumen was found occluded by the fibrous mass already mentioned. Upon further dissection the cystic duct also was occluded; the right hepatic could not be traced, but the left branch passed near the margin of the fibrous mass. The fibrous nodule extended into the liver for a distance of 1 cm. At no point in the growth could either duct or liver substance be identified, apparently it was fibrous throughout and distinctly circumscribed. The greatest diameter of the gall-bladder was 7.5 cm.; the organ reached 10 cm. below the margin of the liver; was elastic and apparently filled with fluid but the distention was so marked that fluctuation could not be elicited. At the junction of the gall-bladder with the liver was a mass of cicatricial tissue which formed firm adhesions between the two organs. The scar was pinkish red in color and very rough. The gall-bladder was found to contain 225 c.c. of a slightly clouded grayish-tinged fluid; the mucous membrane was covered by a grayish-white semisolid mucigenous substance; when the latter was removed the exposed mucosa was pale and smooth. The walls of the gall-bladder were extremely thin, scarcely 2 mm. in thickness. The peritoneal cavity contained 150 c.c. of a straw-colored fluid.

Cumston[4] maintains that the deep indentations along the anterior border of the organ and the white lines running over the external surface of the liver are characteristic of syphilis, and he holds Virchow responsible for the statement that they occur most frequently in the neighborhood of the suspensory ligament and that the convex surface is a frequent site. After fatty metamorphosis, he says, the gummata are absorbed and replaced by fibrous tissue. In discussing the morbid anatomy of syphilitic cirrhosis of the liver Hale-White[5] says the puckering and the scarring are unlike that of atrophic cirrhosis. In syphilitic disease the scars are big and broad, sometimes one-third of an inch in width; they cut the liver into large areas, as big as the back of one's hand; never do we see the little hobnail projections which are so characteristic of ordinary cirrhosis of the liver. Lazarus-Barlow[6] reports a liver with syphilitic stricture of the bile ducts. The organ was dark green from retained bile and it was almost entirely composed of an enormously hypertrophied left lobe. The right lobe was small and its surface was covered with numerous scars and deep indentations, the seat of old gummata. One mass of fibrous tissue involved the bile ducts; the left hepatic duct was separated from the common by a thin fibrous septum. MacKenzie[7] reported a liver which was uniformly enlarged and had two scars on its surface. The gall-bladder was distended with a colorless fluid and its duct was so embedded in fibrous tissue that the lumen was occluded. He believes that the scars on the surface of the liver are retrocedent gummata and calls attention to the

[1] Read before the Philadelphia Pathological Society, Feb. 9, 1905. From the laboratories of the Jefferson Medical College and the Philadelphia General Hospital.

fact that the cut surface of the organ strongly suggests the presence of malignant disease.

In the case herein reported the microscope did not corroborate the diagnosis of tuberculosis of the liver based on examination of the gross specimen. Although the indentations and the scarring already referred to by Cumston, Hale-White, Lazarus-Barlow and MacKenzie, were not evident macroscopically, they are very clear microscopically. The dipping is marked even at points where the underlying parenchyma is not involved. The perihepatitis which, according to some authors, is a frequent accompaniment of this form of lesion and to which Stockton[8] ascribes the pain and the friction, is not marked in this case. The capsule is thickened at points and this hyperplasia is greatest where the fibrous tissue extends into the parenchyma of the organ. The tissue responsible for the thickening is composed of coarse wavy fibrils which react to Mallory's reticulum stain in a manner similar to the fibrils making up the normal capsule. Between the fibrils are many lymphoid cells which are evenly dispersed and show little tendency to grouping.

As pointed out by Cumston the fibrous tissue is abundant throughout the sections, and as noted by Hawkins,[9] Quincke,[10] Cumston and MacKenzie, it not only surrounds the lobules but penetrates these structures as coarse and fine strands. The picture presented is such as might have been produced had the newly formed tissue originated at the periphery of the lobule and by continued proliferation gradually extended between the liver cells, and as it did so, impinged upon them, whereby they were destroyed; close examination of the sections stained with Mallory's reticulum stain seems to justify the view that the newly formed intralobular tissue is an increase of the already existing reticulum. At many points it is possible to see how long one side of the blood vessels nests of liver cells have been isolated by the increased reticulum and how difficult it is to outline or even trace the reticulum between the liver cells on the opposite side of the same vessel. In an area where the fibrous tissue is abundant it is evident that toward the periphery of the fibrous mass delicate strands of newly formed tissue surround retrogressing liver cells. The picture presented in many respects is similar to that described as present around some of the vessels. Near the center of the tissue such nesting of the liver cells cannot be found. Here the newly formed tissue is closely matted and between the wavy fibrils are many lymphoid cells. In many places the distribution of the fibrous tissue is similar to that seen in atrophic cirrhosis of the liver, that is, from a central focus, very often a blood vessel; it tends, in the majority of instances, to surround each lobule separately, but occasionally embraces several. A frequent picture is the occurrence of circular masses of newly formed fibrous tissue, the centers of which are occupied by blood-vessels, whose walls are thickened but not in proportion to the thickening seen around the bile ducts; the elastica does not figure in the increase.

Distributed throughout these nodular masses are many bile ducts, the walls of which are also thickened by concentric layers of newly formed tissue. The columnar epithelial cells, fairly well preserved, occur as usual, in a single layer. The circular or perhaps nodular masses of fibrous tissue are responsible for the gross picture which was interpreted as miliary tuberculosis. Although nearly all authors point out that there is an increase in the intralobular connective tissue none refer to that seen around the central vein which, while not marked, is readily demonstrable in the sections.

Adami[11] maintains that in the acquired form of syphilis there is a generalized toxic distribution in the organ with a resulting catarrhal hepatitis which may or may not lead to a general fibroid condition. Flexner[12] is of the opinion that interstitial hepatitis is due to a diffusible poison, perhaps a toxin elaborated by the syphilitic virus or organism. He regards the lesions of syphilis as comparable to those produced by the *Bacillus tuberculosis* which sometimes gives rise to a diffuse fibroid overgrowth at other times produces tubercles. A careful histologic study of the sections in this case lends support to these opinions. The distribution of the fibrosis may be explained in the following way: The toxic substance is brought to the liver by the portal vein and hepatic artery, probably most of it reaches the organ by the former route. We know that the interlobular veins break up into numerous capillaries at the periphery of the lobule which increases the vascular area and this is instrumental in slowing the blood current so that the liver cells at the periphery of the lobule are most severely affected by the syphilitic poison; these cells degenerate or undergo necrosis, the reticulum is irritated, either by the poison itself or by the products of the degenerated cells and as a reactionary process the reticulum, together with the interlobular tissue, is increased.

Scattered throughout the sections, although not numerous, are circular or oval cellular areas which at times involve an entire lobule. They are composed, for the most part, of large cells with palely staining nuclei resembling the hyaline leucocytes; although there are some polymorphonuclear leucocytes present, they are not increased over the number found in other portions of the liver. In the centers of the areas are many granular and fragmented cells and considerable granular detritus; liver cells cannot be identified; here the accumulation of hyaline cells is not so great as farther toward the periphery. Most of the accumulated cells are surrounded by newly formed fibrous tissue except in a number where the encirculating sclerosis is incomplete and the gap is filled by long spindle-cells closely resembling those commonly seen in formative tissue. These isolated patches were at first taken for abscesses but upon finding the polymorphonu-

clear cells as abundant in the liver tissue elsewhere their presence was looked as being incidental. Bacteria could not be demonstrated. Closer study suggested miliary gummata.

Marchand,[13] when speaking of the cellular infiltration of syphilitic livers in infants, tells us, that although the greater number of cells are mononuclear many are polymorphonuclear. According to this author even if the polymorphonuclear cells had not been found in the other parts of the organ their presence need not rule out miliary gumma. Hawkins maintains that miliary gummata are rare, whereas Quincke says they are less frequent than the diffuse form, but when found they are scattered throughout the liver in abundance and resemble tubercles or neoplasms. He notes that deformity of the organ is less likely to occur in the miliary than in the gummatous form. Adami found giant cells among the leucocytes in the small gummata, while Einhorn[17] noted the presence of granular detritus, fat globules, few nuclei, nuclear fragments, and occasionally connective tissue fibrils. The capsule, he says, is made up of scar tissue. Fat was not demonstrable in these sections, but this fact does not imply that it is absent, as not until the sections were examined microscopically was the true condition of the specimen recognized and since the tissue was not fixed in osmic acid the fat was dissolved during preparation.

Incidentally it may be mentioned that the sections also show a moderate amount of pigmentation near and around the central veins where more or less congestion is present.

Sections taken from the fibrous mass at the junction of the hepatic and the cystic ducts are entirely composed of dense wavy fibrils of connective tissue containing many lymphoid cells principally diffused throughout the fibrous mass; occasionally they form mantels around the blood vessels. The nodule contained no recognizable liver substance nor were there any ducts found. Although not found at the usual site for gumma, nevertheless the fibrous mass was taken to be a retrocedent and cicatrized gumma. Adami refers to gummata occurring in the region of the gall-bladder, and Marchand in his studies of syphilitic livers in infants found cellular infiltration around the vessels at their entrance to the organ. Reference has already been made to the case reported by Lazarus-Barlow who believed the occlusion of the hepatic duct was due to the organization of an old gumma. In MacKenzie's case the cystic duct was so occluded that the bile could not be made flow by pressure upon the gall-bladder. The miliary gummata in the present case are in all instances of recent origin and it is very difficult to believe that they are due to the same infection which gave rise to the gumma at the cystic and hepatic ducts. It is fairly well established that a second syphilitic infection may occur in the same individual and this may account for the presence of the recently formed gummata. This view is suggested because sometimes miliary gummata of recent origin are found in the masses of old fibrous tissue which have degenerated and become necrotic just as the liver tissue or the reticulum of the organ in this case.

The greenish tinge of the liver, skin, conjunctiva and other organs mentioned in the post-mortem protocol can be explained by the fact that the bile ducts are extensively involved by the fibrosis, and obstruction must have been present.

Fournier[14] maintained that he never failed to find ascites accompanying syphilitic disease of the liver, but Trinkler[15] says in some cases it is absent. This, to a certain degree, depends upon the involvement of the blood vessels, especially the extent or as has been maintained by some authors, associated irritation or actual inflammation of the peritoneum. The accumulated fluid found in the gall-bladder at autopsy was attributed to the tuberculous condition of the liver with secondary involvement of the walls of the gall-bladder; sections of this organ show no conspicuous change in the wall, no gummata, and therefore the hydrops felleæ seems to have resulted from irritation incident to obstruction of its duct.

The time intervening between the infection and the development of the lesion in the liver has been much discussed. Adami states that in acquired syphilis of the liver we know little about the effect upon the organ during the secondary stage, but judging from the lesions seen in infants with the acquired form of the disease there is a general intoxication which results in a catarrhal hepatitis. Hilton Fagge[16] reports a case with a history of a syphilitic rash, falling of hair, macular syphilides, jaundice, unconsciousness and finally death. Although a microscopical examination of the sections of the liver was made, he says, there were present only such changes as could be attributed to a general toxic condition of the organ. Cumston maintains that the liver is not affected until at least five years after the infection, but may become involved as late as ten or twenty years.

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Burlington Commencement.—The annual commencement exercises of the medical department of the University of Vermont were held at "The Strong," June 28. Those to receive the Faculty prizes were: A. W. Bridge, of Burlington, Vt., first prize; Leon L. Lawson, of Nicholville, N. Y., second prize. Awarded for the highest rating during the entire four years' course.

SOME REMARKS ON SUDDEN BLINDNESS FOLLOWING ORBITAL INJURIES. REPORT OF CASE.

BY H. B. DECHERD, M.A., M.D.,
OF GALVESTON, TEXAS.

FROM ancient times to the present there have been reported many cases of sudden blindness following injuries which involved the orbit but not the eyeball itself. These injuries may take the form of blows or falls upon the orbital margins (with or without demonstrable fracture) or upon other parts of the skull (contrecoup), penetrating wounds such as gunshot or punctured wounds with canes and umbrellas; and occasionally result from falls upon other portions of the body, as upon the feet or buttocks.

Nature of Blindness.—This may be: (1) Immediate and permanent; (2) Immediate, but may improve; (3) A subsequent feature to the injury; (4) Immediate, almost complete, and gradually progress to complete.

Where the traumatism was directed against the walls of the orbit or neighboring localities, the older observers (and some few even at the present day), attributed the visual disturbance to injury of the supraorbital, infraorbital, nasal, frontal, or other branch of the trigeminal, and not of the optic or oculomotor nerves. Thus, reflexly, through vasomotor and trophic influences, it was supposed that both vision and ocular movements could be partially or completely suspended. This theory, of course, is untenable, for as de Schweintz and others have pointed out, if the cause were vasomotor, the ganglion cells of the retina would be the first to degenerate, and there would be an ascending instead of a descending neuritis. (A similar theory as regards sympathetic ophthalmia has also been promulgated; that this disease is due to reflexes operating through the ciliary nerves.)

The real underlying factor is no doubt a fracture or fissure of the walls of the orbit, involving the optic foramen or sphenoidal fissure, inducing either direct trauma of the optic nerve, or else hemorrhage into its sheath, with subsequent pressure from blood or inflammatory exudate. In the last, *i.e.*, exudate, the onset and progress of blindness would likely be gradual. Laceration of cranial vessels, vessels of the sheath, or of the central retinal vessels might be responsible for the hemorrhage. Should the fracture involve the middle fossa, a direct injury of the chiasm or optic tract, or an extravasation nearby, could easily produce visual impairment of both eyes. As in the case below reported, a localized meningitis might effect a similar result. Furthermore, it is easy to see how a penetrating foreign body might be directed to the apex along the orbital walls, although these are fairly thin. In a living subject, they would doubtless offer even more resistance than in the dried skull. According to Morton, the inner wall is least protected, and unless the force is perpendicular to its plane, it is directed to the apex. Lacrimal sac and ethmoidal involvements are apt to supervene upon trauma of the inner wall. Penetrating fractures of the roof are quite common, and often fatal.

For permission to report the following case, I am indebted to Dr. P. A. Callan, in whose service it occurred at the New York Eye and Ear Infirmary.

Case.—A. M., male, white, aged nineteen years, was brought by his mother to Infirmary at 9.30 A.M., March 10, 1905. Patient seemed in a somewhat dazed condition; and hence could not give an intelligent history. His mother stated that on the evening of March 9, at 8 o'clock he had been punched in l. eye with the ferrule of an umbrella. (Three days later, he stated that he was standing on the step of a street car, and that someone in the crowd on street corner punched him in l. eye with an umbrella, latter being directed somewhat upward.) Patient appeared very much depressed. Began vomiting while being examined. Epistaxis from left nostril.

Present Condition.—Left eyeball very prominent. Lids edematous, discolored, ecchymotic. Conjunctiva of lower lid markedly edematous. There is a punctured (lacerated) wound in lower lid, 1 cm. in horizontal length, 1½ cm. from inner canthus, and 1 cm. from lid margin. Pupil somewhat iregular and dilated (7 mm.) Only consensual reaction present. Fundus: Disk margins somewhat blurred. Veins larger than normal and tortuous. Vision-figures at about 20 cm. (?) Ptosis and limited movements. Physical examination negative.

March 10.—Since admission has been in a state of semi-stupor. Gives incoherent answers to questions. Retains no food. Does not complain of pain. Temperature 6 P.M., 101° F., pulse, 76; respiration, 24.

March 11.—Slept only at intervals during night. Seemed dazed, and wanted to get up and walk floor. Restless, tossing from side to side. Temperature, 8 A.M., 100° F. Condition of mind improved; more coherent. Retains some nourishment. Neck very stiff.

March 12.—General condition better. Less stiffness of neck. Excruciating pains in back on attempting to sit up in bed. Chemosis and discoloration of lids and conjunctiva more marked. Retains nourishment.

March 13.—Temperature, 4 A.M., 100.4° F.; pulse, 58; respiration, 18.

March 14.—Complains of moderate frontal headache. Had restless night, sleeping very little. Pulse slow since admission; still slow in proportion to temperature. Wound in lower lid almost healed.

March 15.—Temperature, 4 P.M., 102.6° F.; pulse, 60; respiration, 24. Condition about same; mentally slightly improved.

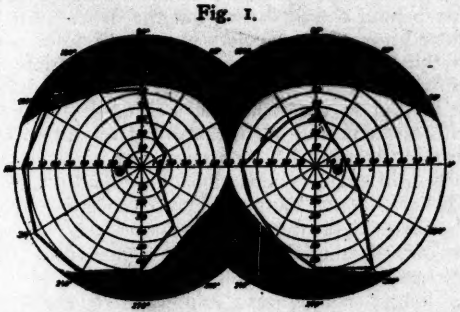
March 16.—Very restless night; tossing about and sitting up in bed. Temperature, 8 A.M., 99.8° F. Pains all over body. Neck still somewhat stiff.

March 17.—Temperature, 8 A.M., 99° F.; pulse, 60; respiration, 20. Feels more comfortable. Tension slightly minus. Only consensual pupillary reaction.

March 18.—General condition greatly improved. Temperature normal. Swelling and edema much diminished.

March 20.—Slight pupillary reaction to direct light stimulus. Fundus examination of O. S. shows lessoned inflammatory reaction, and on exaggerated scleral ring. O. D. shows beginning descending optic neuritis.

Fig. 1.



March 21.—Neuritis O. D. more marked even than in O. S. at earlier date.

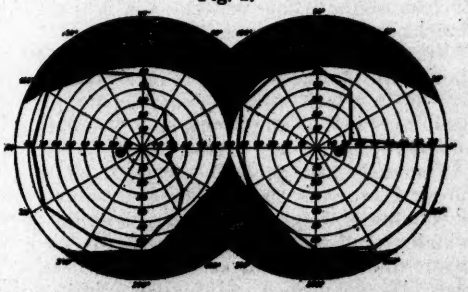
March 23.—Veins enlarged and tortuous in O. D.; swelling of nerve fibers.

March 28.—Disk O. D. clearing up. Disk O. S., beginning pallor; margins of disk easily seen; hardly any signs of neuritis. V. O. S. = 6/60; V. O. D. = 6/5.

March 30.—Margins of disk of O. D. no longer blurred. Left nerve head getting paler. Vision O. N. same.

April 3.—Patient much improved; feels quite well. V. O. S. has temporarily improved to 6/30. Fundus O. D. nearly normal. Discharged. Told to return to Outclinic once weekly for observation of O. S.

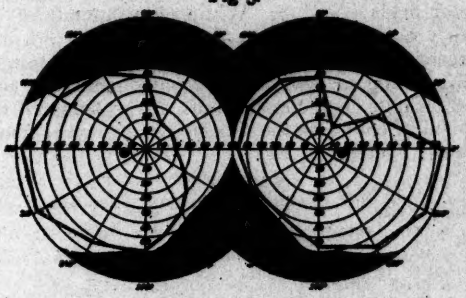
Fig. 2.



Diagnosis.—Separation of fronto-ethmoidal suture into optic foramen (left side), causing pressure on optic nerve, with hemorrhage and localized meningitis inducing neuritis in both eyes.

That so few of these cases are correctly diagnosed is surprising, after a perusal of Callan's and Von Holder's statistics. The former cites 25 occurring in his own practice, with autopsies on three. He thus explained the nature of the traumatism: "The frontal bone unites with the nasal, maxilla, lacrimal and ethmoid bones by a continuous line of sutures, until the lesser wing of the sphenoid is reached; and at this point the suture line bifurcates, forming an obtuse angle. Quite near the apex of the angle is the foramen opticum. The jar made by the blow would find

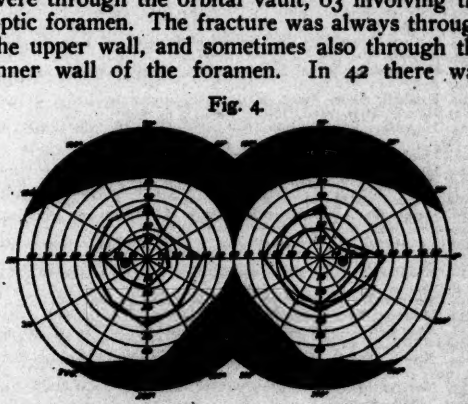
Fig 3.



its weak point along this line of sutures; and the first resistance would be at the bifurcation adjacent to the foramen opticum. The movement or jar could not follow both lines with equal force at and beyond the bifurcation; consequently the unequal strain would result in fracture of the bone into the foramen opticum, causing compression of the optic nerve and sudden loss of vision in the eye."

Berlin, quoting Von Holder's 124 cases of skull fracture, found 86 of the base; 79 of these were through the orbital vault, 63 involving the optic foramen. The fracture was always through the upper wall, and sometimes also through the inner wall of the foramen. In 42 there was

Fig. 4.



hemorrhage into the nerve sheath, but never without fracture of the bony canal. Hence, it can be inferred that in many skull-base fractures, involvement of the orbit escapes notice entirely, either because the patient dies and the autopsy (if any) is not thorough; or also because the other symptoms mask those of the eye. Later on, when atrophy is discovered, it is usually ascribed to some other cause than fracture (reflex; direct injury to nerve, etc.). In addition to the cases already noted, Hewitt (System of Surgery) notes 68 fractures of the base, 23 extending into the orbit. Indeed, fracture of the

walls of the orbit, usually involving the optic foramen, have, on close clinical study and post-mortem investigation, so often been found to be the basis of sudden blindness following orbital injuries that it may practically be regarded as a *sine qua non*.

For fields for March 21, 27 and 31 (Nos. 1, 2 and 3) are shown in accompanying diagrams. On April 12, an attempt was made to take the color fields (No. 4). White (the outer field) is fairly accurate; but the fields for blue, red and green, could not be distinguished with certainty, all seeming to have about equal dimensions (inner field). The constrictions of the fields correspond of course to the situation of the nerve fibers most affected.

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THE SEXUAL NECESSITY.[1]

BY E. L. KEYES, M.D., LL.D.,
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I HAVE been allotted ten minutes and asked to present briefly a medical point of view, a suggestion as to the lines along which this Society shall approach the community in an educational way—for this is an educational symposium. And it seems to me that I may do this best by attacking the matter at its kernel.

The gist of the whole subject, as I believe, lies in the sexual problem, a problem we usually discuss behind closed doors; but the doors must be opened now if the Society expects to accomplish anything educational. The dissemination of knowledge along pathological lines will doubtless be helpful in deterring the stupid, the ignorant but innocent and right-minded from spreading disease through the community—that is the correction of such obvious and widespread errors as a belief that the danger of communicating syphilis ceases upon the cicatrization of the chancre; the old, oft-quoted fallacy that a gonorrhea is no worse than a cold, the belief that a mild gleet is no longer contagious; and, finally, the most abominable of fallacies that a proper treatment for a mild gleet is sexual intercourse—even matrimony.

While a broader knowledge upon all of these points is most essential to the community in its own interest, yet this does not hit the root of the evil which, in my opinion, is the dual standard of sexual morality for the two sexes, based largely in modern days upon the idea that sexual exercise is, on the whole, sanitary to the male, if not essential to the best performance of his other general physical functions and necessary for the preservation of his sexual potency.

This idea, upheld by a considerable minority at least, perhaps by a majority of the medical profession, as well as by a large contingent of the laity in a loose way—this idea, I repeat, is the nucleus of the whole matter—and it is this idea that I propose to discuss.

From a medical source should come some authoritative utterance in controversion of this fallacy upon which, as a foundation, the lay educator may build—amplifying and elaborating his superstructure to any extent.

The early man probably obtained his wife by physical prowess and held her in subserviency, he doubtless doing the fighting and the bread-winning and she ministering to all his needs and wants, more as a favored servant than anything else. He was prince and she was subject to him. The right of man to exact sexual tribute from the weaker sex appears to have been granted as a matter of course. All the histories of prostitution touch upon this subject and make it clear that, in the earlier days in the East, it was considered a part of the duty of the host to provide for the sexual necessities of those to whom he

[1] Read before the American Society of Sanitary and Moral Prophylaxis, April, 1905.

owed the rite of hospitality, even considering it a courtesy to go so far as to offer his daughter for the accommodation of his guest. And this custom in its entirety, I have been told by a guide conversant with the remote regions of Morocco, still obtains in that district to-day.

Man in his strength and physical might, therefore, exercised a power of selection over the weaker sex and appropriated or dispensed the favors of the female at will.

The fighter seems naturally to be sexually overvigorous; the continuous physical worker and the athlete in training not so.

I am told by a general in the United States Army, who has seen a large amount of campaigning among the Indians in our Northwestern country, that, in his experience, the Indian undergoes a period of rut in the spring-time. Then it is that he paints his face, bedecks himself with feathers, and goes upon the warpath; and, when a band has raided a settlement—while the fighting is still going on—the warrior rushes in among the burning tents of the village of the enemy, and at once proceeds to ravage the women.

Women, as a rule, admire a fighter; one who is bold and aggressive appeals at once to them and is granted a favorable reception in a general way, while the feeble, effeminate male is looked down upon and turned slightingly aside.

Moreover, it is the well-known habit of the community to look leniently upon the sexual errors of the male, while those of the female are frowned down upon with unrelenting severity—as if to say, the lily once smirched is ruined forever, while the coarser fiber of the oak leaf may receive many a bruise and still be accepted by the community. This is illustrated forcibly by the popular sentiment existing to-day in the South. If a black man is known to have sexual relations with a white woman, he is run out of the town and fortunate if he escapes lynching. But if a black woman seduces a white boy, the matter does not appear to be so serious—lynching the woman, at least, is not one of the sequences.

In the same way, any jury in the North will deal gently with the man who shoots at sight the villain who has seduced his wife or daughter; but no one thinks of shooting the woman who, by her wiles, has seduced his son.

This spirit of recognizing a certain sexual right on the part of the male, therefore, still exists and is accepted and tolerated by the community as a whole—not by the church, not by the law, not theoretically by the community—but practically it is a fact that it is so tolerated.

How then is this sentiment, this tradition, this unwritten law to be overcome? Only by educating the young male, teaching him to develop his character, teaching him that his sexual yearnings are to be restrained like his propensity to overeat, to overdrink, to overexercise; teaching him that because he wants a thing it is not, therefore, necessarily good for him that he should have it, but often harmful; by assuring him that not only will he not perfect or retain his sexual potency by indulging in illicit intercourse, but that he is more likely by excess and irregularity to impair it—and this information it is the province of the medical profession to impart, and to impart it forcibly, speaking as a unit and with no uncertain voice.

But how shall we prove this last proposition upon which there are held diametrically opposite opinions in the profession? There is not time nor would there be much purpose in appealing to many authorities. I shall cite two, however, as types.

Milton, in his work on gonorrhea, boldly states that sexual intercourse is necessary for the preservation of the sexual function. He takes the broad stand that any organ, not exercised, gradually but necessarily loses its power, and that impotence is the direct consequence of continence—of course citing cases.

Acton, On the Reproductive Organs, on the other hand, with equal insistence claims that absolute continence is compatible with perfect preservation of the sexual function and, equally, cites striking cases in proof—and so on through the list of authors.

Is this expression of opinion then a matter of personal point of view? I think, manifestly, yes.

Anyone reading Milton's book is at once struck by the force, the vigor, the rankness of his style. Here is a physical man rejoicing in the air he breathes, the food he eats, in every vital act. He was, doubtless, full of physical necessity and recognized, as many stalwart young men certainly do, a consciousness of physical comfort, a clearing out of the cobwebs of his brain, a sense of bien-être, when following a regular and systematic sexual life, that was absent when his sexual relations were interrupted. There are many, very many, such individuals in the community; and if they cannot marry, they habitually resort to illicit connection and, because they feel better after the act, persuade themselves that they cannot live without it; and this is particularly true if they allow their imaginations to have full play.

Read Acton's book, on the other hand. Here is an intellectual type. He is no gross feeder and is not in any sense carnally minded. His delights are in the pleasures of the mind and the soul—and yet he is forceful, shows character, and is surely a manly man.

So one gets a few cases that support his thesis and generalizes from them; and the other does the same. Which is correct?

But now, leaving generalities, let me resort to the direct appeal.

One of you, gentlemen, has a charming daughter. She is delicate and refined, sensitive, emotional, but pure in heart and has no thought or suspicion of any sexual appetite, desire, or neces-

sity. She has reached the age of—let us say thirty years, and you recognize that, slowly but surely, her virginity is crystallizing and that she is getting angular in mind and body; opinionated, narrow, discontented—in short, that she is becoming an old maid. She does not know it; but you do. She is suffering from balked maternity.

Now, put yourself the question; you who, in the case of a young man apparently suffering from distended seminal vesicles or the teasing of insistent sexual desire, are perhaps willing to suggest sexual intercourse—would you brutally say to this fair sufferer—go and get a man? God forbid! Rather let her suffer; rather let her die, if need be, than debase herself and sully her vestal purity.

And why should not the same standard be held up to the boy? Why should not he be helped to form character by resistance and to cultivate manhood by honest purity of mind and body? For it is the imagination that does the mischief. Except in case of disease or strong inherited tendency, the sexual appetite is not insuperable. Very many honest citizens reach manhood without ever having practised sexual intercourse and are none the worse for it. Most of these have had nocturnal emissions and very many, it must be admitted, have practised self-abuse more or less; but the braver and purer minded among them are not injured by these occasional lapses from integrity and, if their minds are kept reasonably clean by manly exercises and outdoor sports, they are not in the least degree menaced by impotency. On the contrary, impotence, nervous or real, is vastly more often the result of sexual excess than of sexual continence, as the case-books of any practitioner interested in genito-urinary work will attest.

The testicle is a gland like the tear gland, largely under the control of emotional influences. It is not concerned in the ordinary actions and doings of everyday life. That one, by practising the emotion of grief or sadness and weeping copiously once a week or oftener may learn to perform the act of crying more creditably than some harder-hearted individual, I will admit; but this individual would not lose the power to cry even if he did not exercise it for half a century.

And, finally to leave the theory and opinion and come down to a matter of hard fact, capable of physical demonstration: It may be safely and surely affirmed that no amount of continence ever caused atrophy of the testicle.

Now, if continence, too long continued, can produce impotence, that fact should be evidenced by a wasting of the testicle. And I confidently assert that this is never the case; nor has anyone, to my knowledge, ever claimed it to be so. On the contrary, atrophy of the testicle, to a greater or less extent, very often follows prolonged sexual abuse and excesses—notably those of masturbation, because the latter are more excessive. Indeed, throwing the testicle wholly out of function forever in a physical way—as occurs after the blocking up of the excretory duct on both sides in double gonorrheal epididymitis—does not produce atrophy of the gland, as all physicians know perfectly well to be the case.

If there is anything more pitiable in life than the young sexual neurasthenic, debilitated by sexual irregularity and excess, it is the old man, the victim of years of irregular and illicit indulgence, whose mind still gloats over forbidden pleasures which his body can no longer gratify. Death is his best friend to terminate an unhappy and polluted existence.

If the youth, sowing the wind, could appreciate fully the whirlwind he is likely to harvest, it would stay him in many a mad act and conduce to the salvation of his body as well as of his soul.

SOCIAL PROPHYLAXIS AND THE CHURCH.

BY REV. HENRY A. BRANN, D.D.,
OF NEW YORK.

THE menace to the very existence of the human race necessarily implied in the dreadful and loathsome disease which your honored and learned society exposes and opposes, has always met with powerful opposition from the Church. It could not be otherwise, considering that the Church hates and tries to counteract the vice which is the root of the disease; and that the human body, which is a necessary part of man, comes next in importance as an associate and partner to the human soul in the mind, in the theology and in the practice of the Church. Not only is it part of her divine mission and occupation to practice the spiritual works, but also and consequently the corporal works of mercy; and the sick of body, whether from their own fault or from the fault of others are special objects of her tenderness and care.

To the special form of disease in which your Society is so deeply interested she has always opposed the antidotes within her competence. But she has not yet exhausted either her power or her influence. One of the most important helps that she could give to society would be to make antecedent syphilis an impediment diriment of marriage. At the present time it is not such an impediment; but if it is clearly proved that the syphilitic directly endangers the life of the non-syphilitic contracting party and destroys the life of the offspring, the case would easily come into the category of matrimonial impediments, all of which have moral and social reasons for their existence. If consanguinity and affinity to the fourth degree inclusive, for social reasons, have been made impediment, there are reasons why syphilis should take rank in the category. That it is a reason for separation of the parties after marriage no one questions; particularly, if the syphilis be produced by the infidelity of the party suffering from it. No man or woman is compelled to live with an unfaithful partner, whether diseases follow the act of infidelity or not. Thus holds the Church and to this extent

at least she punishes the culprit and protects the innocent.

But even if the Church made syphilis an impediment diriment of marriage, the remedy would still be only partial and limited. The Church's law would be accepted only by her faithful adherents. Those not faithful or those rejecting her authority would still remain in the syphilitic zone; and no human power could completely limit their corrupting action. Still, even any limitation of the scourge would be a great benefaction for humanity.

Certainly the Church tries to eliminate the scourge. Her whole moral code and her sacramental system aim specially at the destruction of the vice of impurity which is the root and the fountain of disease. She holds up to young and old models of purity for imitation, particularly the fair white rose whom the poet calls "our tainted nature's solitary boast." Convinced as the Church is that education and knowledge alone are not adequate remedies, for experience shows that the medical schools, which have the greatest knowledge of the disease, are not immune from the vice which generates it; she insists on the special inculcation of the principles of morality and of purity in all her schools for the young. Nor does she stop at mere teaching in school.

She periodically during the year often separates the sexes, and gives to each lessons of warning regarding the dangers of the venereal scourge with which God smites those who violate the laws of purity. In every school of boys; in every school of girls; in every church during periods of retreat special instructions, admonitions, warnings, are given regarding the mental and bodily diseases consequent on sexual abuse.

The "missions" which are constantly given in our churches; the "retreats" given to women in convents, and to men in churches and colleges, are always opportunities which the clergy use to point out the dangers, physical and moral of impurity; and the plainest language is used so that there is no lack of knowledge on the subject.

As much depends on the conscience and on the strength of the individual's will, the Church tries to form and develop the one, and to strengthen the other. She trains the individual from his earliest years to loathe and shun the vice of impurity; and the occasions which lead to it; and both by word and example encourages him in the struggle against impulse and evil inclination. If he is weak, if he pleads weakness, she strengthens him by calling his attention to the fact that he is a free agent and that no internal or external temptation has the power to coerce the free human will. She reminds him that he is a free agent and tells him in his trials to call on the supernatural aids which are always ready for the Christian in prayer and in the sacraments. Constant prayer and frequent reception of the sacraments are her most potent factors in the prophylaxis of the individual and of the family from contamination and infection.

But the Church does not confine her action in this regard to mere instruction or warning. She does not try to protect social purity merely by strict surveillance over the conduct of the sexes in their relations to each other; and in their separate and isolated relations in schools and colleges; but she applies what I think is the most efficient remedy in the world for the elimination of diseases resulting from social impurity.

This remedy is the confessional. All who know the meaning and the power of the confessional will understand what I mean by this remedy. She claims it to be an institution of divine origin, the aim and purpose of which is to absolve the duly penitent from sin; and there is no faithful son or daughter of the Church who does not use this institution; and the most faithful Christian is the one who uses it most frequently. The little child from the age when he begins to think evil is taught to confess his sins in a tribunal, where sits a man who is at the same time a judge, a physician and a father. This man known as the priest is to warn the penitent against the first erotic impulse, the first impure thought, and tells him plainly, although not so explicitly as the physician, the physical dangers of the vice to which he is exposed. And if he fails and becomes the victim of passion, the priest consoles him, strengthens his renewed resolutions and passes him over to the physician for physical treatment. There is no priest who has experience but will tell your honorable society what every penitent knows, that a man will never become a syphilitic if he frequents the confessional and uses the means therein suggested! Nor will anyone with a Christian conscience, suffering from an infectious disease, enter into marriage, and he will certainly have this conscience if he goes to confession and obeys his confessor.

But even with all this teaching and practice, syphilis will be propagated; for the teaching of the Church and of all the professions does not control the majority, even of that part of the human race which is called Christian. The Church, however, will do her part in the great work which you are trying to accomplish and is always ready to cooperate with a profession which she has always loved and cherished; a profession that shares with her the credit of having done so much to relieve physical and mental infirmities. In protecting the sacred body of man from disease begotten of crime, the Church is the close ally of the medical profession; and both will ever work together for the physical and moral good of society.

Acute Carbon Bisulphide Poisoning.—ALBERT P. FRANCINE (*Am. Med.*, May 27, 1905) reports a case occurring in a man aged thirty-seven years, who was employed in a mill where carbon bisulphide was used in the manufacture of artificial silk. Up to the present time but few cases have been reported in American literature.

MEDICAL PROGRESS.

SURGERY.

Incontinence of Urine.—E. C. DUDLEY (*Journal A. M. A.*, June 3) describes a new operation for the relief of the urethrocele with imperfect urinary control, sometimes met with in multiparæ. It is based on the same principle as the operation of Albarran for the same purpose; the urethra, however, is not dissected free and the danger of its sloughing is avoided. The first step consists in denuding a horse-shoe-shaped surface between the meatus and the clitoris, and to either side throughout its length. In the second step of the operation the meatus is drawn up to a point near the clitoris and secured there by means of two sutures. The lateral portions of the denuded surface are then closed. The first two sutures stretch the urethra upward toward the clitoris, and the lateral ones tend to hold it in its new position. The idea is to straighten the urethra by longitudinal tension and to collapse it and to hold together the dilated walls and to overcome the sacculation at the neck of the bladder by traction. In many cases it may be necessary to operate at the same time for the associated cystocele, and in nearly all cases to perform perineorrhaphy for the relaxed posterior vaginal outlet. When there is very much relaxation of the tissues about the clitoris, and there is danger of it being pulled down, he would take a reef in the tissues above that organ, enough to keep it sufficiently high to hold the urethra taut. He has performed this operation five times since January 1, 1905. In the first four, the relief was immediate, and, so far as known, continuous. The last case is still too recent to be correctly estimated.

Value of Edebohls' Operation in Nephritis.—Decapsulation of the kidney behaves in many ways like a benesection: The operation itself is very bloody and increases the flow of blood within the kidney itself in the parenchymatous forms, while in the interstitial type a certain amount of pressure is taken away from the vessels, and the blood can more readily enter and leave the organ. Since most of the lesions must be ascribed to deficient blood-supply, it is evident that the process will be favorably influenced. In uremia, decapsulation will also do good, since the increased blood-flow will tend to remove waste-products. If the exciting causes of nephritis (lead, uric acid, alcohol) are kept out of the body, and sufficient healthy renal tisue is left, a cure may follow the operation. In the three cases of W. SCHEBEN (*Münch. med. Woch.*, May 9, 1905) the most marked sign of improvement after the operation was diminished excretion of albumin; the edema disappeared somewhat later.

The Operative Treatment of Fracture of the Patella.—Since the advent of aseptic surgery the treatment of fracture of the patella by the operative method is daily gaining more advocates, and is followed by better functional results than it was ever thought could be obtained by non-operative methods. H. M. RIGBY (*The Practitioner*, May, 1905) strongly advocates the wiring of every fracture of the patella unless there is present some definite contraindication. This view is taken as a result of a series of twenty-one cases operated on by the author during the past four years. Under the old treatment, by strapping, extension, splinting, etc., an average period of at least six weeks was spent in bed with the leg on a splint, and this was followed by a tedious out-patient treatment for several months. Finally, at the end of six or nine months, patient was left with a partially stiff knee, and was quite unable to follow any laborious occupation. By the operative treatment the patient remains in bed for a period of a fortnight after the operation, and for the first ten days the leg in kept in a splint. After fourteen days the patient is able to get up; he leaves the hospital at the end of three weeks and, as a rule, can walk without artificial aid. In six to eight weeks he is able to perform his usual work. The author claims that by the operative method: (1) The loss of time consequent upon the receipt of the injury is enormously reduced. A clear gain of at least six months can be figured on in an average case; (2) that the operation ensures sound bony union with a perfect functional result. In all the author's cases the open method of treatment was adopted. This consisted in: (1) Exposing the fragments by an incision which is preferably semilunar; (2) emptying the joint of blood-clot, serum and torn tissue; (3) freshening the surface of the fragments; (4) passing silver wire sutures through holes bored by a drill, and (5) suturing the lateral tears in the expansions of the quadriceps. The results obtained in this series of cases are interesting. In seventeen cases the average stay in the hospital after the operation was twenty-three and a half days. Sixteen of these patients were able to walk out of the hospital without any support, with the power of flexion of the knee to a right angle. Infection of the knee-joint occurred in one case which ultimately required amputation of the leg. In a second case an effusion of blood serum had to be evacuated under anesthesia. And in a third case there followed slight superficial suppuration, which was probably due to a lacerated wound received at the time of the accident.

Peritoneal Gauze Drainage.—W. D. HAGGARD (*Journal A. M. A.*, May 27) calls attention to the fact that the fancied necessity for drainage after abdominal section has been greatly lessened by the knowl that the peritoneum can easily dispose of considerable amounts of blood and serum and that accumulatins of pus are generally sterile. He calls attention to the likelihood of wound infection from drainage after hernia operations, and to the danger of resulting hernia after infected abdominal wounds, and states that this is infrequent after wounds which have healed asceptically. He advocates drainage through the cul-de-sac of Douglas, and describes his methods in detail. He places the gauze in the abdomen, so that, after the operation is completed and the incision sutured, the gauze may be reached through a new incision in the vagina with less danger of infection

Bronchoscopy for Removal of Collar Button from the Lung.—E. FLETCHER INGALS (*Journal A. M. A.*, May 27) reports an interesting case in which a collar button had remained in the air passages for fourteen months. The fluoroscopic examination was practically negative. Under general anesthesia, a large amount of pus was evacuated, and in it were the remains of the collar button. The patient made an uneventual recovery.

Anchylosis.—J. B. MURPHY (*Journal A. M. A.*, May 20, 27 and June 3) reviews what is known of the embryology and the histologic development of joints, classifies the pathologic modifications of anchylosis, and discuses the formation of synovial sacs and their artificial production and the various tissues involved. The synovial fluid is, he finds, a liquefied collagen, a result of the degeneration of connective tissue, and not, as Virchow taught, a secretion from the surface

of the cavity. This fact is a basal one in the surgical management of capsular or articular anchyloses; another one is the thorough freeing of the tissues so as to allow unrestricted motion of the joint. Murphy believes that the elements that have most contributed in causing failures are the insufficient or defective exsection of the synovial membrane capsule and ligaments and insufficient interposition of fat and aponeurosis, or of fat and muscle, between the separated bony surfaces. After these come infection and sensitiveness to pain, limiting motion after operation. Muscular aponeurosis with fat makes the best interposed tissue; if this can not be had, then muscle and some fatty tissue should be used. Muscle flattens out into an aponeurosis in many joints, but it does not withstand so well the early pressure required for a good result. A number of cases are reported in detail, and, with the elaborate series of pictures, well illustrate these and other points brought out in the article. In conclusion, Murphy reviews the literature of the attempts to produce new joints, and says: "In our work we have been able, by the interposition of fascia and muscle, covered with a layer of adipose tissue, to produce normal movable joints, with capsules and collagen intra-articular fluid. This, we believe, is the first systematic production of new and practically normal articulations."

THERAPEUTICS.

Excision and X-rays Combined in the Treatment of Exophthalmic Goiter.—It is claimed that the pressure symptoms which are such a prominent feature of this disease are caused by an increased blood supply of the thyroid gland. This idea has been applied to the therapeutics of exophthalmic goiter and Kocher proposed that the larger vessels to the glands be tied off and the latter also, partially excised. The results were fairly good, although no effects were noticed at all in a certain proportion of the cases and in other the after effects were most disagreeable. C. BECK (*Berl. klin. Woch.*, May 15, 1905) is convinced, however, that the method should not be abandoned and from this observation with the X-rays on the vascular supply of new growths he is prompted to suggest that a similar effect on the vessels of the thyroid may be produced by the same agency. The final results may be accelerated if in addition one of the lobes of the thyroid be previously excised. In two instances in which partial thyroidectomy was not followed by any result after the elapse of a year or more, the rays were applied and a marked improvement in the nervousness and tachycardia was noticed. In a third case, the Roentgen rays were used immediately after operation with a much more satisfactory result. The sessions consumed at first five to ten minutes daily, and then were given weekly with astonishing effects, so that in five months time the remaining portion of the gland could scarcely be felt and the exophthalmos and the tachycardia had entirely disappeared. The case is of great interest and should animate a more general investigation of the subject.

A New Field for the Roentgen Rays.—GOEBEL (*Münch. med. Woch.*, May 16, 1905) has made the very interesting observation that goiter is very amenable to treatment with the Roentgen rays. The change set up in the diseased tissue is probably not due to closure of the blood-vessels but is an actual destruction of parenchyma cells, since a diminution of size takes place very rapidly. Soft tubes are generally employed for ten minutes at a time, at a distance of 10 cm. General symptoms, due to disturbed thyroid function, were never seen.

A Further Contribution to the Therapeutics of Iron.—After thorough experiments upon animals in pharmacological laboratories followed by clinical observation, SHEDMAKER (*Chicago Med. Rec.*, April, 1905) states that ovoferrin, a new compound of iron, is the only iron yet produced which meets the requirements established by those authorities from whom were obtained most of the laws governing present-day scientific therapeutics. His clinical observations cover a series of 117 cases, consisting as follows: Secondary anemia from hemorrhage, 8 cases; gastric ulcer, 6 cases; convalescence (from typhoid fever, pneumonia, diphtheria, rheumatism), 18 cases; headache, due to anemia, 8 cases; the anemia of chronic parenchymatous nephritis, 6 cases; incipient pulmonary tuberculosis, 8 cases; neurasthema, with marked anemia, 10 cases; anemia from prolonged lactation, 7 cases; chronic gastro-intestinal catarrh, with anemia, 8 cases; convalescence from infantile diarrhea, 12 cases; nervous school girls, with anemia, 10 cases; malaria cachexia, 4 cases; chlorosis, 12 cases. The author concludes as follows: (1) That a careful study of the authorative researches on the physiologic and therapeutic effects of iron show a well-defined relationship between the chemical constitution of iron compounds and their comparative assimilability and therapeutic effects; (2) that the group of compounds of which ovoferrin is at the present time the only representative, constitute the best method of administering iron in clinical conditions attended with blood impoverishment because (*a*) it is more rapidly and completely assimilated as proved by the greater increase in hemoglobin and red blood corpuscles as evidenced by clinical studies of its effects in comparison with other forms of iron. (*b*) It does not disturb digestion, irritate the alimentary tract or produce constipation. (*c*) It has a noticable effect in increasing the appetite. (*d*) It has in addition to its hematinic action, a pronounced effect upon general nutrition which endows it with value as a general tonic in clinical conditions attended with general debility.

The Antiseptic Properties of Smoke.—The popular notion that fumes of various burning substances have healing properties, is not without scientific foundation. M. A. TRILLAT (*Les Mouxeaux Remèdes*, April 24, 1905), finds that the smoke of wood, sugar and various other substances contains an appreciable quantity of formaldehyde gas. Saccharose when burnt yields a smoke that contains a fairly large quantity of this gas. This probably explains the beneficial effects which have been attributed to the smoke obtained by burning raisins or grapes, a practice which is found in the traditions of household medicine, and which may be traced back to Hippocrates. The author found that smoke markedly inhibits the growth of bacteria.

Mercurial Injections in the Treatment of Syphilis.—This subject is reviewed by LAMDIS in (*Gaset. des Hospitaux*, April, 1905) as to method therapeutic action and value. *Methods.* (1) The local or Bouchard's, in which the injection is made into the site of a specific lesion. Under this head come the subconjunctival and subarachnoid injections; (2) the intramuscular injections, the most frequently employed, least painful and assuring rapid absorption; (3) the subcutaneous, which, however, has been almost superseded by the intramuscular; (4) the intravenous, very delicate and exceptional; (5) most recently the intratracheal. Both soluble and insoluble salts and metallic mercury are used. Biniodid and benzoate are most commonly employed. *Therapeutic Action.* A local re-

action is first noticed; pain and inflammation varying with the different preparations used. The specific action is the same as with other methods of administration, but more definite and quicker. It is possible to calculate the amount absorbed. It is customary to inject daily a quantity of mercurial representing .01 gm. of metallic mercury. A possible toxic action due to additions of other substances, to certain forms of mercury (cyanide for example), or to intolerance, must be kept in mind. Absorption is rapid; in the intravenous method instantaneous. Elimination begins early and is the same as in other methods. *Advantages.* (1) Maximum effect from a given dose. (2) Exactness of dosage. (3) Non-interference with the digestive system. *Disadvantages.* General intoxication and local accidents. On account of the rapid absorption it is impossible to counteract intoxication in time. Of local symptoms continued and severe pain, extensive inflammation, and sometimes even a febrile condition are objectionable. *Indications.* (1) Grave complications, such as coma, lesions of vital organs (larynx, ear, eye) and extensive phagedenic destruction call for a method of quick results; (2) when other methods fail to accomplish the desired result; (3) in certain cases, for quickly establishing a diagnosis. Intolerance of the skin and stomach and social conveniences of the patient make injection the treatment of choice.

X-ray Treatment of Cancer.—The microscopic changes in the tissue, says E. G. WILLIAMS (*Journal A. M. A.*, May 6), should be our guide as to the therapeutic possibilities in the X-ray treatment of malignant growths. It is evident, he states, that the elements of the tissues are affected according to their vitality. Dead organic matter is unaffected, and the more active the growth the greater the effect. Next to this is the accessibility of the tissues to the rays. Hence the better results with superficial or skin cancers. That moderately deep tissues can be affected is shown by experience, and the way to reach them without producing necrosis of overlying tissues is to lengthen the distance of the tube and the time of exposure. For deep growths, radical surgical measures should be recommended, as the patient should be given the benefit of the probability rather than the possibility of good results. In such cases, however, operation might be rationally followed by X-ray treatment to destroy what may remain of the malignant growth. Inoperable cases should be treated by the X-ray because remarkable results have been obtained and the most distressing symptom of pain relieved.

Protection from Roentgen-Ray Injuries.—C. L. LEONARD (*Journal A. M. A.*, May 6) calls attention to the serious risk that X-ray operators undergo, especially if they follow the practice advised of testing the qualities of the rays on their hands with the fluorescent screen. The only practical method is to limit their radiated field by covering the Crookes tube. For this purpose he uses a pasteboard box a little wider than the diameter of the tube and covered with X-ray lead foil a little heavier than the ordinary tea lead. This extends two inches below the bottom of the box, and can be adjusted so as to limit the field to any extent required. It is not necessary to cover the anode end, and the box is held on a bracket over the portion of the body to be treated; if a very small field is required, a local shield may also be employed. He thinks possibly some effects are due to the strong induction field surrounding the coil which, especially in large hospitals, should be kept in another room, but with the controlling apparatus within the operator's reach. For the dermatitis of the operator's hands, he advises twice daily soaking in very warm water and scrubbing with Eichhoff's superfatted resorcin soap, followed by inunction of lanolin containing half an ounce of boric acid and a dram of resorcin to the ounce. For the acute erythema of X-ray treatment, he employs a stearate of zinc powder with 10 per cent. ichthyol, which he thinks acts as a prophylactic against severe burns. This should not be confused with stearate of zinc ointment, which may do harm.

PRESCRIPTION HINTS.

Dysmenorrhea.—In spasmodic and neuralgic dysmenorrhea the following prescription will prove beneficial if administered several days prior to and during the menstrual epoch:

℞ Extracti hyoscyami fluidi.....3ii
Extracti cannabis Indica fluidi.....3i
Extracti cimicifugæ fluidi.....3iv
Spiritus camphoræ 3i
Spiritus etheris compositæ.....q.s. ad. ℥iii

M. Sig. Teaspoonful in water three times a day.

Ptyalism.—For tender, bleeding gums from any cause, associated with fetid breath:

℞ Formaldehyde (40 per cent. sol.).....3i
Thymoli .....gr. x
Tincturæ benzoini compositæ.....3ii
Alcohol .....q.s. ad. ℥iii

M . Sig. Teaspoonful in wineglass of water as a mouth wash every two or three hours.

Trigeminal Neuralgia.—During the acute attack it is often the best policy to resort at once to the hypodermatic use of morphine, which will not only still the pain and bring the patient quick relief, but, as some authors claim, it may even have a curative effect. The danger of establishing the morphine habit renders a trial of other analgesics preferable in all but the most severe attacks. Quinine in ten grain doses, repeated once or twice, should be given when there is the least suspicion that malaria may be the underlying cause. Salicylate of soda stands only second to quinine with which it may be given and by combining with them one of the coaltar derivation a most effective anti-neuralgic preparation is obtained. The dangers attending the administration of the last mentioned class of remedies should never escape the physician's memory. Gelsemium in doses of five to fifteen drops of the tincture is a powerful remedy that is less used now than formerly. Iodide of potassium in full doses is often beneficial even in patients in whom no suspicion of syphilis exists. Arsenic in the form of Fowler's solution is one of the most reliable remedies. Counter irritation of any kind may bring relief. An elegant preparation will be obtained by mixing in equal parts chloral hydrate, camphor and menthol. On sensitive faces this may cause a blister. Heat or electricity is useful and should not be forgotten when running the therapeutic gamut in search of the the remedy for the individual. In selecting the effectual treatment for each patient there is opportunity for the exercise of much skill on the part of the physician in testing the several lines of treatment in rapid succession. Should all fail the intervention of surgery must be sought.

For Headache of Ovarian Origin.—

℞ Ammonii bromidi 3vi
Ext. hydrastis fl. .....℥ss
Tinct. gentian. comp. .....℥iss
Aquae .....℥iv

M. Sig. A dessert-spoonful three times a day.

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SATURDAY, JULY 8, 1905.

ONE ASPECT OF THE TUBERCULOSIS QUESTION.

TUBERCULOSIS will never be conquered until the public intelligence grasps the situation and the public will is directed to grappling with it. Consequently it is gratifying to note the educational trend of present efforts as exemplified in the deliberations of the Society for the Study and Prevention of Tuberculosis.

How most surely and swiftly to accomplish this educational end is the practical side of the question. No education will be received which does not arouse a personal and active interest, and to arouse such an interest in the public at large it is necessary to appeal to an absolutely universal motive.

All are not born altruists, but some achieve altruism and some may have altruism thrust upon them. Some will join in the antituberculosis campaign from sheer philanthropy; some by personal experience or that of their friends have come to recognize the needs of others; but there remains a large proportion of the frankly self-centered who can be made to realize the situation only by pointing out to them the economic value as such, by charging it up to profit and loss. Those who listen unmoved to the horrors of the White Plague among the tenement population, because of their very remoteness, are arrested by the fact that each death from tuberculosis entails an economic loss to the community of from $1,500 to $2,000. What does this imply to the city of New York alone? By conservative estimate an annual loss of productive labor amounting to over $20,000,000. The same calculations as applied to the whole country give a total annual loss of $330,000,000. Surely in view of these figures it is not unreasonable to demand the same sum to be applied to prophylactic measures which shall ultimately eliminate the needless loss.

Such are the arguments which must be presented in order to bring about a popular cooperation between the ideals of the altruist and the investments of the commercialist.

It should be the function of every practising physician to foster and further this point of view, and when the public shall have accepted it with its implication of utilizing national resources as an ounce of prevention rather than as a pound of cure, then and not till then, as Mr. Devine justly points out, the ultimate responsibility devolves again upon the medical profession.

Let no one think that the success of the economic appeal implies a purely sordid and commercial spirit. Such success is achieved only through a growing sense of essential unity in the social body, a sense pregnant with hopeful possibilities.

THE PROPHYLAXIS OF SCARLATINAL NEPHRITIS.

IT is twenty years since Jaccaud recommended an absolute milk-diet in scarlet fever, as an efficient precaution against nephritis, and this practice has been universally followed. But, recently, doubt has arisen in the minds of many clinicians as to the wisdom of this procedure. The experience of one careful observer may serve to put these doubts to rest.

The observations of San.-R. Dr. Ziegler (*Centralblatt f. Kinderheilk.*, May, 1905), represent his experience in the treatment of 218 cases of scarlatina, both in private practice and in the Hospital for the Orphans of Military Men in Potsdam, his observations extending over a period of fifteen years. During the first half of this period there were 115 cases which did not receive the prophylactic milk-diet. Of these cases fully 50 per cent. developed nephritis, of which five died. In the remaining half of this period, in the 103 cases of scarlet fever, 100 received a milk-diet, with not a single case of nephritis. Of the remaining three cases which

did not receive a milk-diet, two developed nephritis.

Statistics have sometimes been characterized as exceedingly untrustworthy, particularly in medicine. The above figures, however, are a convincing argument in favor of the prophylactic treatment of scarlatinal nephritis.

In spite of these and similar experiences, many modern clinicians still look with dubious eyes upon the efficiency of the milk-diet in scarlatina. Of these Baginsky favors milk-diet for only the first fourteen days of the disease, and believes that even then the possibility of the appearance of nephritis cannot be avoided.

Another observer, Zuppinger, of Vienna, utterly discredits any preventive value of the milk-diet in scarlet fever, and of the same belief are Piza (Hamburg) and Fischl, in Biedert's Text-Book of Children's Diseases, who, moreover, attribute to the milk-diet a positive harm to the patient, by diminishing his nutrition.

If the earlier experiences of Ziegler may be cited as an argument in favor of the milk-diet, then his results since 1892 may be considered an adequate refutation to the argument of the above. During this time he treated 138 cases of scarlet fever, of which 131 received the milk-diet. Of these 130 remained free from nephritis, while one case suffered from nephritis after a complicating attack of diphtheria. The other six cases entered the hospital during the stage of desquamation, with nephritis in full blast, while one contracted it owing to disobedience of orders in partaking of a mixed diet with other patients. In these seven cases, therefore, the prophylactic milk-diet was not employed.

All these cases reported comprised 13 hospital epidemics and 24 isolated cases, and represented forms of scarlet fever of practically the same type and virulence. The results of Ziegler, therefore, furnish a nice scientific demonstration of the value of this dietetic procedure, which may be placed in the same category, as regards convincing completeness, with the statistics of the antitoxin treatment of diphtheria.

SOME COMPARISONS.

NOTHING is more salutary and illuminating than an occasional unprejudiced comparison of our own standards with those of others. An opportunity for such a comparison is offered the American medical profession in the statistics and comments set forth in the *British Medical Journal* for June 3, already referred to editorially in our issue of June 17, 1905. These statistics include summaries of the educational and legal requirements for the practice of medicine in 19 foreign countries and colonies.

Viewed as a whole the uniformity of these standards is more noticeable than the deviations. In certain items the requirements of foreign countries are practically unanimous among themselves but different from those in America, particularly in the length of time required to be spent in medical study, which covers a period of from five to seven years. The entire cost of tuition, also, strikes the American mind as temptingly low. In France, for instance, the total necessary cost of a professional education is estimated at something less than $300. A preliminary general education is a universal requirement abroad, ranging from a liberal high-school course, as in Holland, to one terminating in the degree of B.A., as prescribed in Denmark. In many instances a generous allotment of the classics is specifically indicated. It is possible that in certain cases these preliminary requirements are more imposing upon paper than in actuality. Spain, for instance, prescribes the equivalent of "the degree of bachelor," but the fact that the course is usually covered "between the ages of nine and fifteen years" indicates its secondary character. For the most part, however, the statements undoubtedly represent solid and actual attainments. At the lowest, this contrasts with the general condition in this country, where so many of the medical institutions practically waive preliminary education.

The medical course once embarked upon differs very slightly from that in our own country, comprising courses in physics, chemistry, histology, anatomy, pathology, materia medica, general medicine, surgery, obstetrics and the special branches. The curricula of the various countries differ chiefly in point of emphasis. Thus in Germany stress is laid upon personal clinical instruction, whereas in Italy the method is largely one of demonstration, allowing a wider field for experimentation and research, but failing to provide, as the clinical system does, the personal contact with actualities and the precision consequent thereon.

It is interesting to note how the twofold aspect of the profession, academic and social, which is indicated in this country by the double requirement of diploma and license, is recognized abroad. In France and Italy the State license carries with it the title of Doctor of Medicine. In Austria,

Hungary, Denmark, Belgium and Spain, the degree carries with it the State license. In the latter four countries, however, the university practically is a department of the State. In Germany the two phases are kept distinct, the *Staats-Examen* giving the right of practice, but not conferring the degree, a function reserved to the university. The degree is said to be taken, however, by nearly all practising physicians in Germany. In Holland, where a similar separation obtains, the difficulties in the way of getting a doctor's degree as regards preliminary education and academic training make the majority content with the degree of *Arts*, which confers the privilege of practising.

An interesting corollary to the matters noted is to be found in the notes on the social conditions existing in the various countries. Oddly enough the extremes in this respect are both found in Latin countries, the lowest in Italy where the profession is recruited from those of plebeian birth to whom the doors of "society" are forever closed except in instances of phenomenal eminence, and the highest in Portugal where doctors are "at the top of the social ladder." In Hungary a doctor wins little recognition, and in Austria his standing is only fairly good. In the Netherlands, however, a certain prestige attaches to the profession, and in Denmark doctors are regarded with the same respect which is accorded to the minister and the judge.

In most European countries there is a suggestion of caste foreign to American ideas, but in other respects the privileges, duties and problems of the profession are much the same as we find them here.

ECHOES AND NEWS.

NEW YORK.

$17,000 to Kill Mosquitoes.—The Appropriation of $17,000 for the mosquito warfare which Health Commissioner Darlington proposes to conduct on Staten Island, has been granted by the Board of Estimate.

New Emergency Hospital.—St. Gregory's, a new emergency hospital has been opened in the four-story building at 93 Gold Street. It will take the overflow from the busy House of Relief in Hudson Street. Superintendent Flater, Assistant Superintendent Duncan, three ambulance surgeons and four nurses make up St. Gregory's staff. The hospital has also two visiting surgeons.

Brownsville's Hospital.—Young women and young men of Brownsville have formed a society called the Mount Carmel Benevolent Association. The object of the society is the building of a hospital, in some select place of Brownsville, for the benefit of the poor. The hospital will be named the Mount Carmel. The society has about two hundred members, and donations were received last night amounting to $1,200, including dues.

No Site Chosen for the City's New Tuberculosis Sanatarium.—Dr. Darlington, president of the Board of Health denies the report that he had secured a site in the towns of Greeneville and Mount Hope, for the new tuberculosis sanitarium. He said he had looked over a number of sites, and had secured options on some. He has the consent for two locasions near the Hudson River, forty miles from New York, and thought it probable that he would take one of these.

City in Good Health.—The death-rate in this city for the first six months of this year was considerably lower than for the corresponding period of 1904. It was nearly as low as the death-rate in 1903, and but for cerebrospinal meningitis would have been the lowest death-rate for several years. The death-rate for the past six months was 19.75; for 1904, 22.68 and for 1903, 19.14. For the week ending on Saturday last the death-rate was 18.55 as compared with 21.63 for the same week in 1904.

Ambulance Surgeon Injured.—Dr. T. Harris Cherry, a surgeon in Hudson Street Hospital, was injured, perhaps fatally, and his driver, Edward Stokes, was hurt, when an ambulance in which they were answering a call for a Fourth-of-July accident was struck by a northbound Sixth avenue trolley car at Centre and Reade streets, on July 4. As a result Dr. Cherry is suffering from posible fracture of the skull, scalp wounds, five broken ribs and internal injuries. He was taken back to the hospital, where his condition is extremely serious, particularly because of his internal injuries. He is a native of Georgia and a graduate of the College of Physicians and Surgeons of this city. He has been at Hudson Street Hospital about a year.

PHILADELPHIA.

Infected During an Operation.—While performing an operation some time ago Dr. Francis R. Packard infected one of his fingers and as a result he is now ill at the Pennsylvania Hospital; his condition is improving and recovery is expected.

To Study Foreign Methods of Nursing.—Miss Georgie R. Weaver, directress of the Philadelphia Lying-in Charity Hospital, and Miss Edith A. McPherson directress of the Nurses Training School of the Medico-Chirurgical Hospital, sailed for Europe last week. They will visit various hospitals in Germany, France and England to study the methods of nursing.

Free Bed Endowed.—P. F. Kernan has endowed a free bed in St. Mary's Hospital, in memory of Harriet Richards, of this city, who died last year. Mr. Kernan has stipulated that the bed shall be used by any worthy person without regard to color, race or religion. It will be under the patronage of the Sisters of St. Francis attached to St. John's Catholic Church.

Meeting of the Dental Association.—After many papers pertaining to dentistry were read, the society elected Dr. H. W. Arthur, of Pittsburg, president; Dr. J. T. Lippincott, of Philadelphia, first vice-president; Dr. L. N. Weaver, of Philadelphia, recording secretary; Dr. V. S. Jones, of Bethlehem, corresponding secretary; Dr. R. H. D. Swing, of Philadelphia, treasurer. Dr. W. J. Roe gave a clinic at the Jefferson Hospital upon two case of cleft palate. The Medico-Chirurgical Hospital gave luncheon to the members of the society.

To Keep in Touch with Hospital Reports.—Auditor-General Snyder has instructed the traveling auditors of Pennsylvania to examine every three months the books of all the hospitals receiving State aid, and report to him the number of free patients, the number of pay patients, and the amount paid weekly by the latter. This information will be sent to the legislature to be used in regulating the amount of appropriations given to each hospital. This procedure will prevent padding hospital reports when appropriations are wanted.

CHICAGO.

Decrease in Contagious Diseases.—With the exception of smallpox, all the other contagious and infectious diseases show a decrease in the number of cases reported.

Opening Exercises of the Chicago Emergency Hospital.—This hospital was opened Tuesday, June 27, at 309 Fifth Avenue. Dr. Richard M. Fletcher is surgeon-in-chief.

Graduation Exercises of Jenner Medical College.—The Jenner Medical College also held its graduation exercises this week, when 15 degrees were given. The address was delivered by Dr. Stuart Johnstone. The class valedictorian was Dr. John D. McKellar.

Hospital Population.—The hospital population of Chicago is lower than at any time since last November, numbering 1,798. The only disquieting feature in the state of the public health is an increase of the typhoid fever contingent, which is unusual at this time of year, and is due, probably, to the quality of the water supply during the past two months.

Commencement Exercises of Dearborn Medical College.—The college held its commencement exercises this week, when 29 students received degrees. James H. Eckels was the principal speaker. He referred to the great responsibilities which rest on physicians, and emphasized the importance of long and careful preparation needed for that profession.

Chicago Casualties.—Returns to the *Record-Herald* up to eleven o'clock P.M., covering Fourth-of-July fatalities, accidents and fires show that twenty-one are dead and 536 injured on account of the celebration. Like figures a years ago up to two o'clock in the morning showed forty-eight fatalities and 1,545 injured. Casualties this year show the following causes: Runaways, 11; toy pistols, 28; powder burns, 70; firearms of all kinds, 94; fireworks, 298; cannon, 35.

Smallpox.—More cases of smallpox have been discovered in this city since the first of the year than during the whole of the previous year. The health department, suspecting that laxity in vaccination is the cause of the increase, have planned to renew a campaign of education. Vaccination of children at an early age is deemed advisable, in view of the fact that most of the cases recently reported have been among the younger children.

Chicago Medical Society Seeks to Enjoin Park Board.—Injunction proceedings have been begun by the Chicago Medical Society to restrain the south park commissioners from interfering with the erection of a monument to Samuel Guthrie in Grant Park, at the foot of Jackson Boulevard. The officers of the medical society assert that it is their right, under ordinances passed by the park board and the city council, to carry out their monument plans. It is believed the park board will make vigorous opposition to the suit brought by the society.

Michael Reese Hospital.—The corner-stone of the new Michael Reese Hospital was laid last Tuesday, July 4, at 10 A.M., by Herman F. Hahn, Chairman of the Hospital Committee. Governor Deneen was present as the guest of honor, and delivered an address. The new hospital, costing $500,000, will be completed next May, and will be six stories in height, of solid masonry, steel and tile, and equipped with the most approved system of heating, lighting and ventilation. There will be accommodations for 240 beds, including sixty private rooms. There will be three operating rooms, and special provisions for isolating patients in the surgical, medical, gynecological and maternity departments. The children's building for both pay and charity patients will be separate from the main buildings, and will have an entrance from the outside.

GENERAL.

No More Plague in Panama.—The indications now are that the danger of the spread of bubonic plague has passed, owing to the energetic and prompt measures of the United States health officials. There has been only one case of the disease, that which occurred at La Boca, and since that was reported the period of incubation has passed without any new case developing. The infected La Boca wharf and village are now thoroughly cleaned and fumigated. If there are no new cases within a fortnight it is the intention to declare La Boca free of plague. In the meantime vessels are being discharged and loaded in Panama Bay. La Boca is entirely isolated.

Foreign Food Products.—Dr. Harvey W. Wiley, chief of the Bureau of Chemistry, is on his way to Europe under instructions from Secretary Wilson, to make an exhaustive investigation of methods of preparing and preserving food products for shipment to America. He will visit all of the leading cities of Europe which have an export food trade with the United States and will be gone until the middle of September. The policy is to have a more rigid inspection of foods. Upon his return laboratories will be established in Boston, Philadelphia, New Orleans and Chicago. At present the only inspection laboratories are in New York, San Francisco and Washington.

Control of the Tsetse-Fly Peril.—The Cologne *Gazette* prints extracts from private letters written by Prof. Robert Koch, who went to German East Africa at the end of 1904 for the further investigation of certain tropical diseases, showing that he had already made important discoveries in connection with the tsetse fly. The Professor found the breeding ground of the fly, and says that the fly can be rendered harmless through simple means. It will be remembered that Professor Koch made the still more important discovery that trypanosoma microbes, which are present in sleeping dropsy, exist in the tsetse fly. He further discovered in April last that the relapsing fever is transferred to man through a small sand tick.

Yellow Fever Situation.—The Panama Canal Commission has received a report by cable from Gov. Magoon relative to the yellow fever situation in June. Only two deaths occurred among employees appointed by the United States and two from among employees of the commission appointed to the Isthmus. The official records show that on June 1 there were employed on the Isthmus 1,493 Americans and 8,209 persons appointed on the Isthmus. On June 27 Gov. Magoon reported the death of S. J. Hirsch, an American clerk in the employ of the Canal Commission. Giovanni Janicelli, non-employee, died on July 1 of yellow fever. No additional cases were reported on that day.

Mosquito Reduction in California.—The California State Board of Health, in its monthly leaflet for April, 1905, calls attention to the utility of a crusade against mosquitoes in certain parts of the State for the purpose of minimizing malarial infection. Last year the marshes about San Rafael were inspected by representatives of the entomological department of the University of California, and those found infested with mosquitoes were treated with crude oil, giving the most satisfactory results, until late in the year, when lack of funds caused a suspension of work and a consequent increase of mosquitoes. A large marsh area, extending from South San Francisco nearly to San Mateo, is the seat of operations this year. Fresh water areas, which abound in the region under treatment, are either filled up with earth, drained, or treated with oil.

Boston Floating Hospital.—The Boston Floating Hospital will commence its trips down the harbor July 6, continuing until late in September. This excellent charity was founded in 1894 by Rufus Tobey, who has given his services to it since that date. A large sum of money is on hand and more is being collected for a new and larger boat, but for this season the present one is being overhauled. The new hospital will, it is hoped, accommodate 100 patients and be provided with a permanent contagious ward. The only requirement for admission is the signature of a physician on a properly filled out certificate; these certificates are in the hands of all the hosiptals and many physicians. The patients must be under six years of age; provisions are made for mothers and one other child during the day.

State Board of Health Guards Against Tetanus.—The June bulletin of the State Department of Health of Massachusetts called special attention to the fact that tetanus frequently follows Fourth of July and other injuries, especially where dirt, paper cartrige wads and other foreign substances are carried into the wounds. It urged all physicians who treat persons injured in this way to administer preventive does of tetanus antitoxin at the time the wounds are dressed. This procedure will surely prevent lockjaw. The department believes that many cases of this disease were prevented last year by this means, but says that there is no reason why every case could not be prevented. Generous supplies of the antitoxin produced in the department's antitoxin laboratory were sent to local health officers of all the large cities and villages and many towns, and the bulletin urged such officers to spread broadcast the information that any physician can obtain gratis what he needs by applying to the health officer.

India and Applied Chemistry.—At the Sixth International Congress of Applied Chemistry, which is to be held in the spring of 1906, at Rome. India, and its work in this direction will be officially represented for the first time. The committee in charge of matters consists of Major C. H. Bedford, D.Sc., M.D., of the Indian Medical Service, Chemist to the Imperial Government of India, as president, and of eight members, all of whom are either Professors of Chemistry at the Indian Universities or chemists to one or other of the provincial governments. There is room for a great deal of original work in India in various branches of applied chemistry, and of late years much activity has been shown. In particular the physiological action and chemical nature of various by-products found in different kinds of native spirits is being investigated at the County Liquors' Laboratory, at Kasauli, of which Major Bedford is director, the object being to enable the government of India to prescribe standards and tests of quality for the different forms of alcoholic liquor locally prepared.

Typhoid Due to Milkman.—A number of cases of typhoid fever are reported in Lynn, Mass. Although the health board of that city has received returns of only one case during the past month, the fact remains that the situation is of such a nature as to cause some anxiety among the physicians. One physician has six cases at present, and others have a lesser number, and the fact that the Lynn health board records show but one case is due to the failure of physicians to report the cases, as they are required to do by law.

Dr. Frank L. Morse, inspector of the State Board of Health, visited Lynn recently to look into Lynn's water supply. He is said to have expressed some uneasiness over the low condition in which be found the storage basins. Dr. Morse discovered that a boy who was employed by a milkman was taken ill with typhoid fever. The boy assisted in bottling and delivering the milk. He worked several days before it was discovered that he was afflicted with typhoid fever. Dr. Morse believes that this boy was the original cause of at least seven cases of typhoid fever. About ten days ago the milkman was taken ill with typhoid fever.

To Reform Hot Springs, Ark.—Hot Springs, Ark., sometimes called the Monte Carlo of the Southwest, will no longer be a haven for the sporting element of the country, if Mr. Hitchcock, the Secretary of the Interior, can prevent it. The Hot Springs reservation is under the jurisdiction of the Government, and Secretary Hitchcock is the responsible officer. He has received many complaints from Government agents recently to the effect that Hot Springs is coming to be looked upon rather as a gambling than as a health resort. Secretary Hitchcock intends to preserve the utility of the reservation as a health resort if possible, but he is at loss as to how to proceed. The gambling resorts and questionable houses are off the reservation proper, and Government authority is accordingly limited. It is believed, however, that by amending the regulations governing the use of the springs the moral tone of the place can be bettered. Failing in this, Secretary Hitchcock will take another tack. Politics is said to be responsible for the fact that Hot Springs is a wide-open town. Complaint is made by reputable citizens there that efforts to reform are frustrated by the politicians. If the Secretary of the Interior finds that he is powerless to reach the lawless element he will call the attention of the Attorney-General to the conditions, with a request that he endeavor to bring about the enforcement of the laws by the local authorities.

The Disease Problem on the Isthmus.—The troubles in the Panama situation are apparently increasing daily. The resignation of Chief Engineer Wallace at a time when his own plans for organization are left in a confused and incomplete state and when so much depends on centralized and authoritative control of a complicated system of work is followed by the news of yellow fever cases increasing in number and also the appearance of bubonic plague on the Isthmus. While there may be no occasion for serious alarm as to the immediate spread of either disease, their existence in any shape cannot fail to have a depressing effect on the workmen already on the ground and will inevitably demoralize others who may contemplate joining the force. The fear of the disease has spread to other ports in the neighborhood, and a declaration of quarantine against the canal belt will by no means tend to quiet public opinion regarding the present situation of affairs. It is quite evident that the sanitary problem is the one of first importance. The most strenuous efforts of the chief medical officer at Panama should be directed toward stamping out both pests with the least

possible delay. If he has been hitherto hampered in any way he should be given the freest rein for the exercise of his authority. In no other way can the present difficulties be properly met. In the present state of sanitary science and when the well understood preventive measures are properly applied there is no longer any reason why yellow fever or plague should exist anywhere, especially in such districts as are under the control of the United States government.

American Climatological Association.—At the recent annual meeting of this association Dr. E. L. Shurley, of Detroit, was chosen president and Dr. Guy Hinsdale, of Hot Springs, Va., secretary. The next meeting will occur at Atlantic City, May, 1906.

International Surgical Society.—The first congress of the International Surgical Society will be held in Brussels from September 18 to 23, 1905, under the presidency of Professor Theodor Kocher, of Berne. The following is the program of subjects proposed for discussion: (1) "The Value of the Examination of the Blood in Surgery," to be opened by Dr. W. W. Keen, of Philadelphia; Professor Sonnenburg, of Berlin; Dr. Ortiz de la Torre, of Madrid, and Dr. Depage, of Brussels. (2) "The Treatment of Prostatic Hypertrophy," to be introduced by Mr. Reginald Harrison, of London; Professor Rovsing, of Copenhagen, and Professor von Rydygier, of Lemberg. (3) "Surgical Intervention in Non-Cancerous Diseases of the Stomach," to be introduced by Mr. Mayo Robson, of London; Professor von Eiselsberg, of Vienna; Dr. Mattoli, of Ascoli Piceno; Professor Monprofit, of Angers; Professor Rotgans, of Amsterdam, and Professor Jonnesco, of Bucharest. (4) "Treatment of Articular Tuberculosis, to be introduced by Professor Bier, of Bonn; Dr. Broca, of Paris; Dr. Bradford, of Boston; Professor Codivilla, of Bologna, and Professor Willems, of Ghent. (5) "The Treatment of Peritonitis," to be introduced by Professor Lennander, of Upsala; Professor Friedrich, of Greifswald; M. Lejars, of Paris; Dr. McCosh, of New York; Professor Krogius, of Helsingfors, and Dr. de Isla, of Madrid. (6) "The Diagnosis of Surgical Diseases of the Kidney," to be introdueed by M. Albarrán, of Paris; Dr. Kümmel, of Hamburg; Dr. Giordano, of Venice, and Dr. Lambotte, of Brussels. Other communications of a practical character, including the presentation of patients, specimens, and instruments, may be made. The conditions of membership of the Society, and further information relating to the arrangements for the forthcoming congress, can be obtained from the Secretary-General, Dr. Depage, 75 Avenue Louise, Brussels, or from Mr. Reginald Harrison, London, delegate for Great Britain.

Cancer Research.—Sir William Church, president of the Royal College of Physicians, addressed the third annual meeting of the cancer research committee, July 5. He said that the year's investigations confirmed the conclusions announced in 1904, that cancer is not associated with peculiarities of diet, climate or mode of life. The experiments had yielded the most interesting results, including a demonstration of the possibility of perpetuating malignant new growths through successive generations of mice in such a way that the cancer cells appeared to be gifted with the power of perpetual multiplication. This power, however, was not manifested at all times and under all conditions. The results thus obtained point to the necessity for more closely studying the processes of cell multiplication, for in this abnormal proliferation and reproduction appear to lie the malignancy of cancer and a clue to the solution of its mystery. This property of perpetual multiplication definitely separated cancer from known infective diseases. Much experimental work had been done in treating malignant growths, but immunizing with serums did not justify the claims sometimes made for them, although in some cases they deprived the cells of the power of growth. The action of radium and radioactive solutions had been carefully studied. It was undoubtable that these sometimes influenced the growth and development of normal and tumor tissues, but there was no evidence yet obtained that radium emanations had any selective or special action on tumor tissues, while the amount of radio-active solutions necessary to produce any action on the tissues far exceeded the quantity that could be safely introduced into the body.

New Jersey Licentiates.—At a meeting of the State Board of Medical Examiners of New Jersey, held at Long Branch, July 5, the following candidates, who passed the State examination at Trenton, June 20-21, were duly licensed to practice medicine and surgery in New Jersey: Herman Bryden Allyn, Philadelphia; Pasquale Bellino, Newark; Albert Page Berg, Philadelphia; Joseph Albert Biello, Philadelphia; Theophilus Henry Boyesen, Egg Harbor City; James Breslin, Freehold; Frederick Norman Bunnell, Tom's River; Ralph Robert Charlesworth, Millville; Arthur Harley Coward, New Egypt; William Price Davis, Jr., Atlantic City; Samuel Ward Dodd, Newark; Joscelyn Joseph Emmens, Philadelphia; Arthur Edward Ewens, Atlantic City; John Eugene Fahy, Philadelphia; Abraham P. Fishman, Providence, R. I.; Collin Foulkrod, Philadelphia; Frank William George, Princeton, Mass.; Frederick Snyder Hammond, Wilmington, Del.; Ernest Rutherford Hoffman, Collingswood; Albert F. Jackson, Campgaw; Charles Higbee Jackson, Camden; Claude Perry Jones, Somerville, Mass.; Henry Benjamin Kessler, Newark; Ignaz Klein, Newark; George J. P. Koch, Paterson; Thomas Benjamin Lee, Camden; Chester Arthur Leigh, Burlington; Harry Elmer Lore, Cedarville; Margaret Mace, Anglesea; Richard Sanford Mallon, Paterson; Amos Jones Mander, Philadelphia; Harrison Stanford Martland, Newark; James Henry McCroskery, Union Hill; Joseph Searle McDede, South Orange; Joseph Zimmerman McDermott, Freehold; William Bernard McGlennon, Newark, Llewella Maria Merrow, Atlantic City; George Grant Mills, Philadelphia; Arthur Caradoc Morgan, Philadelphia; Samuel Alan Muta, Bridgeton; Daniel Jerome O'Brien, Deep River, Conn.; Thomas Aloysius O'Brien, Philadelphia; Clarence Rutherford O'Crowley, Newark; Jacob Lyon Rosenstein, Jersey City; Eugene Paul Schaefer, Newark; Julius Segal, Carmel; George Sigars Spence, Vineland; James Harris Underwood, Woodbury; Nelson Shelly Weinberger, Doylestown, Pa.; Edgar Lee West, Hamilton Square; Edward Clendenning White, Camden; Walter John Whitehouse, Jr., Pottsville, Pa.; Joseph J. G. Williams, Longport; William Walsh Wilson, New Brunswick; Alfred Woodhouse, Trenton. The following officers were elected: President, Dr. Edward Hill Baldwin, Newark; Secretary, Dr. E. L. B. Godfrey, Camden; Treasurer, Dr. Charles A. Groves, East Orange. The medical license of New Jersey will be indorsed by the following States: Maine, Vermont, Delaware, Virginia, Illinois, Michigan, Minnesota, Kansas, Colorado and others.

OBITUARY.

Dr. GEORGE J. A. AHERN, of No. 151 East Thirty-ninth Street, New York, former surgeon of St. Francis Hospital, died suddenly July 4, in that institution, from a

pulmonary hemorrhage. He was thirty-four years old. He leaves a widow and three married sisters residing in this city. He was a graduate of New York University Medical College and was formerly on the staff of physicians at the Manhattan Eye and Ear Hospital.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, June 10.

THE PREVENTION OF PHYSICAL DEGENERATION—CAUSES OF MENTAL DEFICIENCY—SIR FREDERICK TREVES ON HIMSELF AND SOME OTHER THINGS—RETIREMENT OF A MEDICAL M.P.

PROPHETS of the Cassandra type have for some time been giving us the cheerful assurance that the British race is doomed to decay and extinction unless something is done to prevent its further deterioration. To many the alleged deterioration is not perceptible in the race as a whole; it is admitted by all, however, that the conditions of life in the slums of our large cities tend to produce physical degeneracy in their denizens. It has been said that a trueborn Londonor of the fourth generation is unknown. This is an exaggeration, but it embodies a truth of far-reaching importance. The British race is as strong as ever when it has the chance of growing to its normal standard. The rural population is, however, drifting more and more to the towns where the unwholesome environment, combined with drink and debauchery, in a few years wreck the stalwart countryman's constitution and leave their ineffaceable marks on his offspring. Unless this process can be checked there is a real danger that the manhood of the nation may in time be sapped. The doctrine expressed in the formula "Back to the land" has therefore a physiological as well as an economic application. In the meantime a strenuous effort is about to be made to concentrate the scattered forces making for physical regeneration in a National League for Physical Education and Improvement. A meeting is to be held on June 28 at the Mansion House under the presidency of the Lord Mayor—the official *praesidium et dulce decus* of British philanthropy—at which the birth of the new League will be formally proclaimed. Its objects are stated to be:

1. The stimulating of public interest in the various societies which make the improvement of the physical condition of the people their special care.

2. The bringing into close association and, if possible, the federation of such societies, so that they may have increased strength, financial and otherwise.

3. The encouragement of, and the advising of, societies which find it difficult to hold their own under present conditions.

4. Assistance toward the starting of organizations for the benefit of physical health and well-being wherever they do not already exist, as, for instance, in remote districts.

The League, in short, aims at spreading knowledge of the laws of health and organizing a crusade against the causes of degeneration. Among the members of the medical profession who have consented to become vice-presidents of the League are Sir William Broadbent, Sir Thomas Barlow, Sir Frederick Treves, Sir Samuel Wilks, Sir John Burdon-Sanderson, Mr. John Tweedy, President of the Royal College of Surgeons of England; Sir William Turner, Principal of the University of Edinburgh, and late President of the General Medical Council; Sir Lauder Brunton and Sir Victor Horsley. The League will have the blessing of nearly the whole bench of Bishops, the Moderators of the Church of Scotland and of the Free Church, the Chief Rabbi, and Mr. Bramwell Booth. The luminaries of the law are also conspicuous in the list of vice-presidents, while science is represented by such men as Sir Norman Lockyer, Sir William Higgins, Sir Archibald Geikie, Sir Michael Foster and Sir William Ramsey. The leading spirit in the movement is Sir Lauder Brunton, whose views on one aspect of the question of physical degeneration are therefore of special interest. Speaking at a meeting of the Christian Social Union the other day he began with the comforting statement that there is a great deal of masculine energy and indomitable courage and steadfastness of purpose left in the Anglo-Saxon race; "it is for us," he said, "to make the most of these qualities, so that we may take our place among the nations." After referring to the fact that a committee which lately inquired into the matter had concluded that physical deterioration is a bogey, he went on to say that whatever opinions might be held on that point, there could be only one opinion as to the existence of physical inadequacy. No one could go to any large town without noticing men, women and children who were not fitly equipped for the struggle for life, but who were in the abyss and needed help. How, he asked, could such help be given? In a large number of cases parents are ignorant of what to do for the health of their children rather than wilfully careless. "We must," said Sir Lauder Brunton, "impress upon parents that the health of their children is in their keeping. But though parents must be mainly responsible for the health of their children, school teachers must realize that in training the brain the child's body must not be overlooked, and that opportunities must be given for physical recreation and physical training." It is a noble ideal that the League sets before itself. In the better rearing of the child lies the secret of healthy development. But there is one factor in the problem which is either lost sight of or purposely disregarded by our hygienic reformers, and that is the poverty of the parents. From that spring dirt, starvation and disease; in that, too, is engendered the viper-brood of drink and vice which poison human life at its source. The teaching of the laws of health may do something to lessen physical deterioration, but the only remedy that will really go to the root of the evil is the extinction of poverty. And for that we shall have to wait till the millennium.

Closely connected with physical deterioration is mental deficiency. A Royal Commission on the Care of the Feeble-Minded is now taking evidence on the subject. Sir James Crichton Browne, who is Lord Chancellor's Visitor in Lunacy, who appeared before it the other day, said there was reason to believe that thirty per cent. of the population were still living in poverty and were ill-housed, ill-clothed, and underfed—conditions which favored mental degeneration. Mental defects had, however, a much more complex causation than tuberculosis, and sanitary improvements had not reduced the prevalence of mental defects to the extent they had reduced tuberculosis. A large amount of mental defect was due to insufficient and improper feeding in infancy and childhood. Natural nursing had gone out of fashion, and many of the condensed milks and proprietary foods were unsuitable and harmful. Babies fed on them might look plump, but they were pale and flabby, and often suffered from rickets. But he believed that the effects of alcohol in the production of mental defects had been exaggerated. He did not think it played any part in the causation of more than fifteen per cent. of cases of idiocy

and feeble-mindedness. He said that the late Professor Laycock, of Edinburgh University, used to divide idiots into two classes—poverty idiots and luxury idiots. In the case of the latter the causes of mental degeneracy were indolence and self-indulgence through many generations and inter-marrying. The persons thus afflicted were called by Professor Laycock "spoon-bill" idiots, and he used to point out that they were the type represented in "Punch" as aristocratic noodles. He could not say that there were more cases of feeble-mindedness in the upper than the lower class, though among the former there was more inter-marriage. Incidentally Sir James Crichton Browne stated that he did not know a single case in which an inebriate had benefited by a stay in a "home." In some of these retreats he believed drinking went on. Moreover, the idle, loafing life led in these institutions must have a demoralizing effect. In the present state of the law there were a great many weak-minded people, including many who wasted their means, who could not be interfered with unless they showed themselves to be socially dangerous. Sir James Crichton Browne suggested, in regard to weak-minded persons who had been brought up in special schools, that after their training there they should be sent, not to their own homes, but to some place where they could be kept under observation. Weak-minded persons, with criminal and vicious tendencies, might, on the recommendation of the medical officer who had watched the case, be detained in a criminal observation home. Sir James said he knew a medical officer of a gaol who declared that one-third of the prisoners there detained showed signs of mental weakness.

Since he retired from the arena and ceased to raise Olympic dust in the race for professional victory, Sir Frederick Treves has not been idle. When he is not exercising his skill on some favored person to whom the King delights to do good vicariously, he is being interviewed by newspapers or making speeches. To a representative of *Cassel's Saturday Journal* he not long ago explained that he had given up his profession for the simple reason that there was too much to do. He went on to say: "Performing big operations every morning makes existence rather trying. I got tired of my duties; they bored me to death; so, after six and twenty years of practice, I retired. Not that my labors were breaking me down. Nothing would, I think, do that. I have no nervous system, not having had need of one, and I have never had to keep to my bed." Asked to give an account of one of his busy days, the distinguished surgeon said: "I was invariably downstairs at five o'clock. I breakfasted at half-past seven, and almost without exception there was an operation at nine. Then, right up till one o'clock, there were patients to see. After that I went out, and, having lunched in my carriage, devoted the afternoon to consultations. When did I get home? At all hours. This, as I have said, was a sort of existence of which anybody was liable to grow tired." Asked further as to the essential qualities needed for success in surgical work, Sir Frederick said: "The principal feature of success is good health. A surgeon must be strong; otherwise his temper suffers, and his judgment becomes faulty. He must always be fit—in the pink of condition—which is one of the reasons why whenever I had any spare moments I employed myself in swimming, boating, fencing, cycling. The position of a surgeon is one of vast responsibility, requiring extraordinary attention to detail. Not to fail, you must, if you are a surgeon, be alert, keen, perpetually on the *qui vive*. At any moment you may receive a telegram summoning you to some distant town, and unless you are fit you cannot respond to the demands that are made upon you." Sir Frederick Treves concluded the interview by saying that in his retirement he never had a minute to spare. And in point of fact he figures in the newspapers almost as often as a leading politician or a popular actor. One day he is addressing a teetotal meeting; the next he is singing the triumphs of modern surgery at a meeting of ladies interested in the Hospital for Women; another day he is telling the world that the future of the healing art is in the hands of the Japanese. His latest appearance, as far as I have been able to follow his "quick change" performances, was at a meeting of the National Health Society, last week, when he said that in matters appertaining to health the educated classes knew too much for their comfort. They dreaded germs as their ancestors dreaded ghosts. In the nursery the rattle was sterilized daily, and everything boiled, except baby. All the older people were on some highly specialized diet. On the other hand, the lower orders knew too little. They thought people were porous—as porous as blotting paper. They were very interested in eruptive fevers, eagerly watched for the eruption to "come out," and talked of driving it inside again. They had an extraordinary belief in meat, especially when red, and in port wine, because it was blood-colored, and therefore blood-making. Speaking with special reference to the work of the National Health Society, Sir Frederick said it would be well to teach women the actual physical capacity of a child's stomach and the desirability of being clean. Education would go far to abolish preventable diseases, such as anæmia, the diseases of malnutrition, acquired deformities, ill-health in women—and it was his experience that drinking among women came from ill-health, not from ill-morals. Treves's style of oratory, it will be seen, is breezy as becomes one whose love of seafaring led him to study navigation and obtain a master marine's certificate. He has, however, a tendency not uncommon among orators, to overstatement of his case. In his denunciations of alcohol, of which something was said in a previous letter, he, in the words of Lord Beaconsfield, became "intoxicated with the exuberance of his own verbosity" to such a degree as to come perilously near to talking nonsense. He is a good speaker, but as was said by the Emperor Augustus, of another overstrenuous orator, *sufflaminandus est*.

Dr. Robert Farquharson, who has sat in the House of Commons as the representative of West Aberdeenshire for a quarter of a century, has just announced his intention of not seeking re-election to a new Parliament. The reason is that his health has been failing for some time past, and he no longer feels himself equal to the strain of parliamentary life. His retirement will deprive the House of one of its most justly popular and respected members, and the medical profession of a trusted representative. He has played a very useful, if not a very conspicuous, part as a legislator. It was he who piloted the Public Health Act of Scotland safely into port through the treacherous cross currents of party strife; it was said at the time that he was the only member of the House who thoroughly understood that unweildy measure in all the intricacies of its innumerable clauses. Dr. Farquharson who is still a year short of seventy is the chief of the great Highland clan whose name he bears. His cousin, Farquharson of Invercauld, used to be known as the Queen's landlord, because he was the owner of Balmoral, Queen Victoria's favorite residence in Scotland; his brother, Joseph Farquharson, is a distinguished painter, whose speciality is Highland scenery. Robert Farquharson graduated at the University of Edinburgh, and began his professional life as Assistant Surgeon in the Coldstream Guards. After

eleven years' service he became Medical Officer to Rugby, the great school associated with the name of Dr. Arnold. Later he was appointed to the staff at St. Mary's Hospital; he lectured on materia medica, on which he wrote a little book which once had a great vogue among students. Then, suddenly, on the death of a relative he blossomed out into a Scottish laird, owning some 17,000 acres of land in a beautiful part of Aberdeenshire. He is a very familiar figure in London Society, and "gives away" countless brides at fashionable weddings. His walrus-like moustaches made him a favorite subject for the caricaturists of *Punch*. He is a man who has troops of friends and, I should think, not a single enemy.

SOCIETY PROCEEDINGS.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.[1]

Eleventh Regular Meeting, held April 19, 1905.

The President, Edmund B. Wilson, in the Chair.

Members Present.—Adler, Auer, Calkins, Emerson, Gies, Hatcher, Jackson, Lee, Levene, Levin, Lusk, Meltzer, Morgan, Murlin, Richards, Salant, Sherman, Torrey, Wallace, Wilson, Wolf, Yatsu.

Members Elected.—Harlow Brooks, W. B. Cannon, A. J. Carlson, R. G. Harrison, A. P. Mathews, G. H. Parker, A. E. Taylor.

ABSTRACTS OF REPORTS OF ORIGINAL INVESTIGATIONS.

The Relation Between Normal and Abnormal Development of the Frog's Egg.—By T. H. Morgan. The method of development of the frog's egg may be changed by a number of external agents. If the eggs are revolved at the rate of 180 revolutions per minute; if they are put into salt-solutions of definite strengths; if they are subjected to a low or to a high temperature; if they are deprived of sufficient oxygen, or surrounded by carbon dioxide in solution; if they are placed on wet filter paper instead of developing under water—in any of these ways abnormal embryos result.

An examination of the effects of these external agents brings out two points of especial interest. First, that the effects are not gradual, *i.e.*, corresponding in degree to the increasing strength of the agent employed, but that no effects appear up to a certain point, and then suddenly the agent begins to act. Increasing the strength of the agents above this point may, for a small range, increase the effect, but this occurs within extraordinarily narrow limits compared with the lower range of non-action. The most plausible explanation of this mode of behavior in most of the cases is as follows: The agents act by coagulating certain parts of the egg, thereby preventing their further development. Other parts of the eggs that are made up of different colloids or of different concentration of colloids remain unaffected, and proceed to carry out their development as far as the presence of the injured region allows.

The second point was the one that the author spoke of especially. Despite the great diversity in the form of the abnormal embryos most of them may be reduced to modifications of the same type. For example, in many cases the dark cells of the upper hemisphere do not grow down over the lower hemisphere to produce there the embryo, but, remaining at the top of the egg, partially constrict off from the yolk cells at, or even above the equator of the egg. Out of these dark cells the abnormal embryo develops usually in the form of a ring. Sometimes one side only of the ring develops and a half embryo appears; sometimes only the anterior end of the ring develops and an anterior embryo appears (often more or less "open"), etc.

The author especially called attention to the fact that the abnormal embryo develops in the material of the upper hemisphere, while the normal embryo develops over the lower hemisphere. Two interpretations of the difference seem possible. Either the material is totipotent and an embryo may develop anywhere in the egg, appearing in the less injured regions or the material for normal and abnormal development is the same and becomes carried downward during the early stage of normal development from the upper into the lower hemisphere.

The author tested these alternatives in two ways. In the first place he removed, with a needle, the two anterior, or the two posterior, or even all four of the upper blastomeres at the eight-cell stage. The results showed that when the two upper anterior blastomeres are removed the head end of the embryo is defective; when the two upper posterior blastomeres are removed the posterior end sometimes shows defects. When all four of the upper blastomeres are removed no embryo develops, although the blastoporic rim may appear near the equator of the egg, the gastulation process may begin and the differentiation of the germ layers take place to a certain extent.

The author concluded from these results that some at least of the material that goes to form the embryo lies at first high up in the upper hemisphere of the egg. In the light of these conclusions it became necessary to examine once more the early development, especially the pregastrula stages; for, despite the fact that the frog has been a classical object of study with embryologists for over a hundred years, no one has suspected that the embryo-forming material lies in the upper hemisphere and is transported to the lower hemisphere *before* the lips of the blastopore have appeared.

Briefly, the author's examination showed that throughout the early period of segmentation the material of the hemisphere gets pushed far out to the sides of the egg. This is brought about largely by the development of the enormous segmentation cavity. During the later cleavage period the yolk cells of the lower hemisphere push upwards into the segmentation cavity, almost obliterating it. This upward movement of the cells in the interior is compensated for by the moving downward below the equator of the outer layers of the egg. In this way the embryo-forming material is carried into the lower hemisphere. Along its edge the lips of the blastopore develop. The dorsal, lateral and ventral lips roll over the yolk (or more accurately the yolk draws in beneath their advancing lips) and the dorsal organs of the embryo (the embryo in a narrower sense) appear over the lower, or yolk hemisphere of the egg.

Rejuvenescence in Protozoa.—By Gary N. Calkins. The process of conjugation in protozoa involves either temporary or permanent union of two individuals. During this union there is a fusion of

[1] Proceedings reported by the Secretary, William J. Gies, Ph.D., of New York. The authors of the reports have written the abstracts. The Secretary has made a few abbreviations and minor changes.

nuclear material from both organisms, resulting in the formation of new cleavage nuclei in each exconjugant. The process is directly comparable with fertilization of an egg by a spermatozoon and the biological significance of the phenomena involved is probably identical in all living things.

Since 1876 it has been generally assumed that one effect of conjugation is rejuvenescence or renewal of vitality in both of the exconjugants. This assumption has never been submitted to experimental proof. In his Paramœcium work, begun in 1901, the author almost had the proof but allowed the opportunity for obtaining it to slip through his fingers without realizing its importance at the time. The author's object in bringing this up at the present time is to announce that on the last day of February, 1905, he started a new series of experiments with Paramœcium consisting of three different lines at present in about the fortieth generation after conjugation, mainly for the purpose of completing his earlier work.

Another point of general biological importance will also be investigated. In his original experiments the author found strong evidence that the old view that both exconjugants are rejuvenated is erroneous. In 20 pairs which were cultivated after separating from conjugation, one individual of each pair invariably outlived the other, thus indicating an incipient fertilization like that in metazoa. This phenomenon will be given careful study in the experiments now under way.

Temperature and Muscle Fatigue.—By Frederic S. Lee. It has been pointed out previously by the author and others that the contraction process of the muscles of cold-blooded animals in the course of fatigue becomes greatly slowed, while those of warm-blooded animals show no such phenomenon. Lohmann has recently claimed that a cold-blooded muscle on being heated to a mammalian temperature shows a course of fatigue similar to that of mammalian muscle, and, on the other hand, that a warm-blooded muscle on being cooled fatigues like the muscles of cold-blooded animals at a similar temperature. From these supposed effects he concludes that in the matter of fatigue there is no real physiological difference between the two groups of muscle.

The author has investigated the question by very careful methods in a considerable variety of animals and has not been able to confirm Lohmann's conclusions. The muscles of the frog and the turtle show their characteristic method of fatigue whatever the temperature. The muscles of warm-blooded animals, on being cooled and then fatigued, show either no slowing of the contraction process or only a slight slowing. The latter seems to be most pronounced in the rodents, namely, the rabbit, the mouse, and the rat.

On Intra-Ureteral Pressure and its Relation to the Peristaltic Movements of the Ureter, with Demonstrations.—By Daniel R. Lucas (by invitation). By means of a cannula placed in the ureter, and retained without ligatures, and which did not materially interfere with the peristalsis of the ureter, the intra-ureteral pressure and its relation to the peristaltic movements of the ureter were ascertained.

In nine experiments on animals anesthetized with morphine and atropine, the pressure in the ureter arose only to a minute degree, the average being a negative pressure, more pronounced under the influence of diuretics. In five, in which chloroform was used, the pressure was always positive, the irritability and contractility of the ureter were noticeably diminished. In six, under ether, the ureter was noted to be irritable and contractile three hours after the anesthesia was commenced; the pressure was low. In four, in which ether followed the administration of chloroform, ether showed a stimulating effect on the peristalsis, running the pressure rapidly down. In three, in which morphine and atropine, chloroform and ether were successively tried during the same experiment, the specific effect of each, as above noted, was again observed. In an animal in which anesthesia was produced by decerebration, irritability and contractility of the ureter muscle were noted; the pressure was low, tending to negative on stimulating the ureter distal to the cannula. In one animal anesthetized with cocaine by the lumbar puncture method, the same results as with morphine were obtained. In two artificially constructed systems, which were demonstrated, phenomena analogous to those observed in the animals were produced and the causes indicated.

The experiments seem to justify the following deductions:

(1) A suction normally follows the peristaltic wave of the ureter; at the same time a force is exerted on the fluid in front of the wave.

(2) When the ureter is normally acting, the pressure in the pelvis of the kidney remains constantly negative, this condition obtaining through the anatomical arrangement of the pelvis, which prevents it from collapsing under negative pressure.

(3) Under the influence of chloroform, or conditions which retard muscular tone and activity, the pressure in the ureter becomes greater than that prevailing in the bladder.

(4) It seems obvious, then, that the ureter functions as an active agent in the formation of urine. Sollman has shown in his perfusion experiments on excised kidneys that the formation of urine is largely, though, of course, by no means, wholly a filtration process.

(5) Ether anesthesia does not cause a cessation of the peristaltic movements of the ureter, but because of its suppressing action on the urinary secretion, the curves were not recorded.

(6) The ureter remains rhythmically contractile when excised and placed in warm physiological salt solution, or for some time after the death of the animal, when left *in situ*. Therefore contractility is not dependent on pressure.

(7) An increased flow of urine calls forth a more efficient peristalsis, and therefore does not result in an increased pressure.

(8) The force of the peristaltic wave was seen to raise a column of water of considerable height.

(9) When sufficient force is exerted by the intrinsic pressure, to overcome the peristaltic contractions, the urine is forced back into the uriniferous tubules, and accurate communication is attained with the vascular supply of the kidney. Consequently, the blood pressure conditions can be accurately transmitted to a recording instrument. The question then arises, why use an oncometer to obtain records of blood pressure conditions in the kidney?

(10) May not the diuretic effect which is noted after administration of such drugs as mercury, for example, be attributed, in part, at least, to the increased peristalsis of the ureter, causing, as it does, an increased negative pressure, and, therefore, an increased filtration of urine?

Further Observations Upon the Phosphorized Fats in Extracts of the Kidney.—By Edward K. Dunham. (Presented by Phoebus A. Levene.) Last winter, at a meeting of the society, the author reported observations showing that extracts from dried kidneys, obtained with the Rosenfeld alcohol-chloroform method, contained from ⅓ to ⅔ of their weights of lecithins. In the *Arch. f. Exp. Path. u. Pharm.*, Vol. 52, p. 173, Rubow, of Copenhagen, reports similar results of more extended studies, printed in Danish some months earlier.

During the last few months the author has learned that it is not necessary to boil with absolute alcohol and extract with chloroform in order to obtain the large quantities of extract yielded by the Rosenfeld method. Repeated extraction of the fresh, undried organ with 85 per cent. alcohol at 45° C. will accomplish practically the same result. When making these extracts, it was found that, upon cooling, the alcoholic solutions yielded a precipitate from which a substance resembling the protagon of Liebreich could be obtained. It is to this substance that the author directs attention in this report. The yield is from about 0.14 per cent. to 0.20 per cent. of the fresh organ, or from about 0.6 per cent. to 1.0 per cent. of the dried kidney.

In order to obtain sufficient material for analysis, the author employed the method used by Cramer, *Journal of Physiology*, Vol. XXXI, in preparing protagon from the brain. The method employed was, in brief, as follows: The minced kidney, freed from obvious fat, was treated with 5 per cent. sodium sulfate solution at 85° to 90° C., twice, the filtrates discarded and the coagulum extracted, first with 95 per cent. and then repeatedly with 85 per cent. alcohol, at the boiling point, and the extracts filtered from the coagulum in a hot water funnel. The filtrates were cooled to from 0° to 5° C.; the precipitate was filtered out and purified by boiling with absolute alcohol, diluting the filtrate with water to make 85 per cent. alcohol, chilling, filtering, treating the precipitate repeatedly with cold ether to remove cholesterin, dissolving in hot chloroform, reprecipitating by chilling, filtering and expressing all possible traces of chloroform. The resulting product is a white, somewhat crystalline substance, freely soluble in warm 85 per cent. alcohol or chloroform, but reprecipitating upon cooling. It contains fatty acids, phosphorus, methyl, sulphur, and, upon cleavage with dilute sulphuric or hydrochloric acid, yields a reducing substance from which an osazone may be prepared.

For purposes of comparison a similar substance was prepared from beef brains by employing the same method.

Analyses of these products, two from different lots of beef kidneys and one from beef brain, were kindly made for the author by Dr. P. A. Levene, with the following percentage results:

	From Beef Kidney. One Per Cent.	From Beef Kidney. Two Per Cent.	From Beef Brain. Per Cent.	Cramer's Figures for Protagon from Beef Brain. Per Cent.
C	65.61	65.55	65.76	66.25—66.42
H	11.00	11.09	10.66	10.82—11.07
N	3.17—3.15	3.24—3.26	2.51	2.29
P	2.06	2.19	0.97	1.04
S	0.82		1.33	0.71

The substance from the kidney contains distinctly more nitrogen and phosphorus than that from the brain, and that obtained by the author from the brain contained considerably more sulfur than that prepared by Cramer; the cleavage products, however, show that all of these substances belong in the same group. The nature of the glucoside which may be obtained from these substances can only be determined by using larger quantities than have as yet been obtained, and the author hopes to report results in this direction in the near future.

Comparative Physiological Action of Salts of Neodymium, Praseodymium and Lanthanum.—By B. J. Dryfuss and C. G. L. Wolf. The experiments were undertaken to investigate the comparative physiological action of three elements which are of equal valency, and of approximately the same molecular weight, and whose chemical properties are closely related.

The experiments were carried out in vitro and on unicellular organisms, bacteria and infusoria, frogs, pigeons, rats and guinea-pigs. The solutions used were the chlorides, isotonic with 0.6 per cent. sodium chloride. In one case the propionate was used without any marked difference in the result being observed.

The chlorides coagulate egg and serum albumin, but neither the purified albumoses from Witte's peptone, nor peptone are precipitated.

Dilute solutions delay the growth of bacteria and eventually kill. The solutions are not very toxic to spores. Opalina, paramoecia and vorticellæ are killed quickly equivalent solutions of the chlorides acting in the following order of strength: Neodymium, præseodymium and lanthanum.

In frogs voluntary and involuntary muscle are quickly put out of action. This is particularly the case with perfused muscle. The solutions act in the same order as with unicellular organisms. Intravenous injection causes almost instant death, due to multiple embolism.

Attempted chronic poisoning was unsatisfactory. The solutions were introduced both subcutaneously and intraperitoneally. Some of the animals died with ill-defined symptoms. Others remained well, except for areas of induration at the seat of injection. Experiments with oral administration and on elimination will be conducted.

As all the solutions, owing to hydrolysis, are acid in reaction, the authors are inclined to attribute a large share of the acute effects to the acid present. The salts range themselves in their toxicity according to their molecular weights.

The Influence of Bile Upon Blood-Pressure.—By S. J. Meltzer and William Salant. There have not been very many studies regarding the influence of bile upon blood-pressure, and among these the statements are conflicting. Thus Traube, who was the first to study it upon the kymograph, states that the intravenous injection of bile salts causes a considerable fall of the blood-pressure, while Edmunds states in a recent report from Halliburton's laboratory that the effect is an insignificant one.

Nearly all of the investigators of this question within the last fifty years have employed bile salts in their experiments. The results of the authors' experiments were derived from intravenous injections of filtered ox bile into rabbits. Of the several reasons for employing bile and not its salts one should be mentioned: it is the belief of the authors that for biological phenomena we have as yet no right to assume that the sum of the known parts is equal to the whole.

In these experiments all degrees of effects have been observed from an insignificant one to a considerable and even a fatal fall of blood-pressure. But

these different degrees could be produced at will. Besides the quantity and the concentration of the bile it was found that the rate at which it is introduced into the circulation is the most effective factor in the result. A quantity of bile of a given concentration, which, when injected slowly, would cause only an insignificant depression, brought about a tremendous fall of the blood-pressure when injected rapidly. By injecting rapidly normal salt solution the fact has been established that neither the mechanical effect of the rapid injection nor the temperature of the injected fluid can have anything to do with the pronounced effect which is invariably produced by the rapid injections of bile. Although the rapidity of the injection was known to be a factor in the results produced by injections of other substances, it was never taken into consideration in the studies of the effects of bile. Thus, there are also conflicting statements regarding the immediate fatal effect of intravenous injections of bile. These contradictions find their satisfactory explanation in variations in the rate of injection employed in different experiments. Thus, a quantity of bile which, when injected slowly, would produce hardly any symptom, causes death within two minutes if injected rapidly.

As to the cause of the fall in pressure or of the fatal outcome it is generally assumed that it is due to the effect of the bile upon the heart, although opinions differ as to whether it is the heart muscle or the heart ganglia which present the points of attack. As to the manner of the injury Traube, Leyden and other investigators are of the opinion that it is caused by malnutrition of the heart due to the hemolytic effect of the bile. This is *a priori* improbable since the fall of the blood-pressure sets in immediately at the beginning of the injection and the return to normal begins as soon as the injection is stopped. The authors have, however, disproved this theory by direct experiment. On quickly injecting bile the blood-pressure fell rapidly, and the animal died in less than two minutes. The blood which was obtained immediately from the right ventricle did not show a trace of hemolysis.

Autopsies of rabbits killed rapidly in the above-mentioned manner showed in most cases nothing but dilated, flabby hearts. The failure of the heart can be caused either by the bile affecting anatomically the heart muscles or the ganglia, or by a functional process, by inhibiting the heart's action. It is known that bile produces structural changes in muscles and nerve fibers and nerve cells, but it is hardly conceivable that the structural changes could be induced so rapidly, and it is still less conceivable that structural restitution would occur with such rapidity as has been observed to take place in the return of the blood-pressure. It is, therefore, more probable that the bile exerts an inhibitory effect upon the heart.

In this connection the following experiments are of interest:

(1) The inhibitory effects of a stimulation of the peripheral end of the vagus not only did not diminish during an effective injection of bile, but in a few instances were distinctly improved.

(2) The inhibitory effect of the vagus was manifestly unimpaired shortly before the death of the animal when the blood-pressure was not more than a few millimeters of mercury and the heart beats were scarcely perceptible.

A Report of Feeding and Injection Experiments on Dogs after the Establishment of the Eck Fistula.—By P. B. Hawk. (Presented by A. N. Richards.) The fistulous opening between the portal vein and the inferior vena cava was made in six dogs by Dr. J. E. Sweet. Observations were made as to the behavior of the animals when fed on a diet of proteid food. One typical experiment may be summarized as follows: During eleven days on a mixed diet, there were no abnormal symptoms. On the four succeeding days beef meal and milk were fed, with the result that on the fourth day pronounced ataxia, loss of sight and hearing, complete anesthesia and catalepsy were observed, recovery occurring on the next day. After fasting for twenty-four hours, the animal was placed on a diet of fresh, lean beef. In five days a recurrence of the above symptoms was noted. The death of the animal occurred on the fifty-ninth day of the experiment—after the dog had undergone a loss of 42 per cent. of his weight. Autopsy showed a fistulous opening 2 c.m. in length and no collateral circulation. In other cases the symptoms described occurred only after the addition of Liebig's extract to the meat diet. The administration to normal dogs of sodium carbamate, either by mouth or by intravenous injection, gave rise to none of the symptoms observed by Pawlow and associates.

On Chemical Fertilization.—By Jacques Loeb (Presented by William J. Gies.) 1. In two previous publications the author mentioned the fact that by applying two different methods of treatment to the unfertilized egg of the sea urchin, this egg could be caused to develop in a way which resembled in all its essential features the development of the eggs fertilized with sperm. These two methods consisted first, in putting the eggs for about two hours in hypertonic sea water (the method used in the early experiments), and second, in exposing the eggs for from one to two minutes to sea water to which a certain amount of acetic acid or formic acid had been added. When the old method alone was used the eggs did not form a membrane, nor did the larvæ rise to the surface. When the acid treatment alone was used, the eggs formed a membrane, and after about six hours divided into from two to six cells, but then died. When the eggs were exposed to the acid for only a short time, *e.g.*, for three-quarters of a minute, not all the eggs formed a membrane when put back into normal sea water; and in this case only those divided into two or four cells and subsequently died within twenty hours, which had formed a membrane, while those eggs which had not been exposed long enough to the acid to form a membrane neither segmented nor died. If both methods of treatment were, however, combined, those eggs which had formed a membrane developed at about the same rate as the eggs fertilized with sperm. A certain percentage of these eggs rose to the surface of the water in the usual way, while the eggs which had not formed a membrane either did not develop at all, or developed in the somewhat abnormal and slow way characteristic of the treatment by hypertonic sea water alone.

The reader will notice that the eggs were submitted first for about two hours to the hypertonic sea water, and then exposed to the acid. When the order was reversed, and the eggs were exposed to the acid first and afterward to the hypertonic sea water for about two hours, most of them died without developing. This seemed rather strange in view of the fact that in the case of sperm fertilization the membrane formation is the first act in the series of events, while in the above-mentioned experiments it was the last. It occurred to the author that by shortening the time of exposure of the egg to the hypertonic sea water, he might also accomplish the last

postulate of a complete imitation of the process of fertilization by physicochemical means, namely, to get the order of events identical in both cases. This idea proved correct. It was found that when the unfertilized eggs were exposed for about one to two minutes to 50 c.c. of sea water to which about 3 c.c. N/10 acetic acid were added, the majority of the eggs formed the membrane characteristic of the entrance of a spermatozoon. If these eggs were afterwards exposed for from thirty to forty minutes to 100 c.c. of sea water to which 14 or 15 c.c. of a 2½N solution of NaCl were added, those of the eggs which had formed membranes developed into swimming larvæ that rose to the surface. The author has raised these larvæ and they develop into perfect plutei as fast as the larvæ of eggs fertilized with sperm.

It is very remarkable that when the order is reversed and the eggs are put first into the hypertonic sea water for about forty minutes, and then into the acidulated sea water for about one or two minutes, not a single larva is formed, and the eggs behave, on the whole, as if they had been exposed to the acid alone. If it is desired to put the eggs into the hypertonic sea water first and then expose them to the acid, it is necessary to expose them to the hypertonic sea water at least an hour and a half in order to obtain larvæ. On the other hand, if the eggs are treated with acid first and then exposed to the hypertonic sea water for from an hour and a half to two hours, most of the eggs die in the early stages of development.

It may also be mentioned in this connection that if eggs are fertilized with sperm first and then exposed to the hypertonic sea water of the above-mentioned concentration for about two hours, many more eggs die without reaching the larval stage than when the order is reversed. It is therefore obvious that the process of membrane formation caused by the spermatozoon modifies the sensitiveness of the egg to the hypertonic sea water in the same sense as the process of membrane formation caused by the acetic acid. If eggs are fertilized with sperm and then exposed to the hypertonic sea water for from about thirty to forty minutes, their development becomes almost identical with that of the unfertilized eggs treated first with acid and then exposed to the hypertonic sea water for the same period of time. The majority of these eggs segment and develop in a normal way.

2. The question arises as to how far the division of labor between the two agencies used in these experiments goes. Does the treatment with acid cause only the formation of the membrane, or does it also set the internal mechanism of nuclear and cell division into motion? And what is the rôle of the treatment with hypertonic sea water? From the author's earlier experiments he had expected that the latter was required to cause the internal changes necessary for karyokinesis. The direct observation, however, of the eggs treated in the above-mentioned way with acetic acid, shows that the acid treatment causes the formation not only of the membrane, but also, in due time, of the karyokinetic spindle, while the eggs exposed for only thirty or forty minutes to the hypertonic sea water do not show any karyokinetic changes, or, in fact, changes of any kind. It is a striking fact that the spindle formation which can be observed in the living egg of *Strongylocentrotus* seems to be identical in the cases of the fertilized egg and the unfertilized egg treated with acetic acid in the above-mentioned manner. The rôle which the subsequent treatment with the hypertonic sea water for from thirty to forty minutes seems to play is, in the first place, the acceleration of the process of segmentation. When the eggs are treated first with acid, and then for about thirty or forty minutes with hypertonic sea water, they begin to segment, at a temperature of about 19° C., in from an hour to an hour and ten minutes after they had been removed from the hypertonic sea water. After this they go on segmenting at the rate and usually in the manner characteristic of the fertilized egg. The eggs treated with the acetic acid alone, after having formed a membrane, do not begin to segment for about five or six hours (if they segment at all), and they do not develop beyond the four or eight-cell stage, dying as a rule within twenty hours. The treatment with hypertonic sea water, therefore, first accelerates the mechanism of cell division originated by the acid treatment, and second, indirectly through or in addition to this acceleration, increases the vitality or prolongs the life of the egg.

It is not yet possible to say how the acid brings about its effects. Several years ago the author ventured the suggestion that the process of membrane formation was due to coagulation. The author's recent experiments, however, contradict such an assertion, inasmuch as the membrane formation never occurs while the eggs are in the acidulated sea water of the above-mentioned concentration, but only after they are taken out and put back into normal sea water. If the process of membrane formation were due to coagulation by acid, it should occur while the eggs are in the acidulated sea water.

The author considers it possible (but far from proved) that the membrane formation by the spermatozoon and possibly the subsequent process of karyokinesis are due to the transitory action of an acid carried by the spermatozoon into the egg or produced transitorily by the spermatozoon in the egg; and that, in addition, the spermatozoon carries a second agency or substance into the egg which supplies some of the conditions produced in the above experiments by the brief treatment with the hypertonic sea water.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Stated Meeting, held March 1, 1905.

The President, Arthur V. Meigs, M.D., in the Chair.

Gall-Stone Obstruction of the Bowel.—Dr. Alfred C. Wood reported a case of a woman, aged fifty-eight years, who was admitted to the University Hospital for obstruction of the bowel of five days' duration, pain in the abdomen and vomiting. This was preceded by diarrhea lasting one week. For three months prior to this the patient had alternating periods of constipation and diarrhea lasting three or four days. The only other illness having any possible connection with the case occurred eight months before her admission to the hospital. At this time the patient complained of pain in the chest, the attack being called pleurisy. All purgatives administered by the mouth were promptly vomited, and enemata were ineffectual. An operation was performed for the relief of the obstruction, and a gall-stone was found completely filling the lumen of the ileum about six inches from the ileocecal valve. This was removed by incising the bowel and the wound closed with Lembert sutures. As the stone was faceted at either end an examination was made to determine if any others remained in the body. When the hand was passed through the abdominal incision to the region of

the gall-bladder another calculus could be felt in a mass of adhesions. The first incision was then closed with sutures, and a second made over the region of the gall-bladder. In the center of a mass uniting the pylorus, liver, gall-bladder and ducts another stone was found and removed. This wound was drained with gauze. The patient made a good recovery, being able to leave the hospital six weeks after the operation. The wound had closed one week previously.

Dr. J. Allison Scott reported the removal of a gall-stone, 2 inches by 1 inch, from the duodenum, with a suppurative condition for 6 inches or 8 inches on either side in the case of a woman over sixty years of age. The bowel was resected and the woman died. He regards the intermittent attacks of pain as having important diagnostic significance. He has found in the literature reports of two cases of aged women whose gall-stones had been passed at the administration of half a pound of metallic mercury.

Dr. John B. Roberts referred to a case in which he had removed a large intestinal calculus 2½ inches long from a woman who had been suffering many years with the symptoms presented in Dr. Wood's case. There were evidences of old adhesions in the region of the liver, and the stone was covered with intestinal concretions. In the case of another patient a stone 1½ inches long was passed after an attack of severe pain.

The Gardner's Spade Deformity and the Silver Fork Deformity in Fractures of the Carpal End of the Radius.—Dr. John B. Roberts said that these lesions continue to be badly treated by a great number of practitioners, and that it seems impossible to convince the profession that restitution of the normal concavity of the palmar surface of the lower part of the radius is essential for comfortable convalescence and perfect cure. This must be accomplished, even if great force is required to disentangle the fragments and thrust the lower piece into its normal relation with the upper. The so-called "silver-fork deformity" of the fracture, with displacement of the carpal fragment backward, he said, must be absolutely overcome before the fragments may be assumed to have been properly coapted. Fracture in the same part of the radius with displacement in the opposite direction, namely, forward, is frequently unrecognized, and is therefore imperfectly reduced. In this fracture, the general deformity, which Dr. Roberts calls the "Gardener's Spade Deformity," is very characteristic. It is very different from the "silver-fork deformity" of the fracture with backward displacement of the carpal piece. The planes of the forearm and hand are related to each other almost exactly as are the planes of the handle and blade of the gardener's spade. In both lesions the styloid process of the radius is apt to be carried upward toward the elbow. As a result, an imaginary line joining the ulnar and radial styloid processes crosses the axis of the forearm at nearly a right angle or with the radial end nearer the elbow than the ulnar end. In the normal arm this interstyloid line is farther from the elbow on the radial than on the ulnar side. The ulnar head is very prominent at the back of the wrist in fracture with forward displacement; but not so in the break with backward displacement. In both forms of injury, however, this ulnar head may be very prominent at the ulnar edge of the wrist; because the shortening of the broken radius may give a displacement of the hand and carpus toward the radial side of the limb. Examination with the X-ray Dr. Roberts believes to be of aid in diagnosis, though usually it is not needed. The treatment of both fractures, he said, is easy, if the doctor will only use force enough to disentangle the carpal and compel it to assume its normal position. A light, straight splint on the dorsum of the forearm and hand, or a convex splint on the palmar surface is usually the proper retentive dressing after reduction has been thoroughly accomplished.

Dr. Alfred C. Wood agreed fully with Dr. Roberts that the fracture under discussion is one of the most badly treated of all fractures. He believes that in the large majority of cases the shaft is impacted in the lower fragment. He approves of giving an anesthetic to secure reduction when there is much deformity.

Dr. Frank Woodbury referred to the inability at first to give a true prognosis owing to the possibility of comminution of the lower fragment and of the presence of synovitis. He called attention to the recommendation of Dr. Thomas G. Morton to make frequent examinations of fractures, especially of the radius, and the application of hot douching and massage. In the cases he has treated he has not made special effort to reduce the fracture completely at the beginning, but has relied on the later manipulations and has had satisfactory results.

NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, March 6, 1905.

The President, Arthur P. Hitchens, M.D., in the Chair.

SYMPOSIUM ON INFLUENZA.

Etiology and Diagnosis.—The etiology and diagnosis was read by Dr. G. Morton Illman, who stated that the disease was of very ancient record, being mentioned by Hippocrates, as far back as 400 B.C., and particularly referred to the epidemics of 1847 and 1889-1890. He stated that it is generally defined as an acute infectious communicable disease, characterized by fever and catarrhal irritation of the mucous tracts, and contrasted the theory of Pfeiffer who regarded it as due to a bacillus with others, who felt it was due to a toxemia, and expressed the belief that the latter was the result of the bacillus rather than the cause of the infection. He described the bacillus and stated it as found chiefly in the nasal discharge and sputum. He referred to the fact that the disease in many instances extended over a considerable portion of country, and believed that the communicability was due to an infection, in many instances accentuated by a predisposed system, such as general debility, anemia, tonsillitis, and chronic catarrhal condition of the gastro-intestinal and upper respiratory tract. He stated age and sex played but little part in the condition, the period of incubation is uncertain and but little, if any immunity is afforded by a previous attack, but general conditions, such as climate, heating and ventilation are important factors. The diagnosis, he stated, was not difficult during epidemics, but at other times it was very often confounded with an acute febrile bronchitis, coated tongue, headache, pain in the back, fever, chill, vomiting, vertigo and malaise being symptoms characteristic of many conditions, such as typhoid fever, rheumatism, malaria, and tonsillitis. The writer then distinguished between each of these conditions, and believed that accuracy could probably best be arrived at by a process of exclusion, although the finding of the bacillus is the surest, its staining and isolation is so difficult that it is not always practicable.

Influenza Complicating the Ear and Upper Air Passages.—This was Dr. William Hitschler's paper, and was read by Dr. Butler. He considered first its relation to the ear, and stated that it might affect

either the inner ear of the diseases of which little is known, and to which influenza adds no distinct characteristics, or the middle ear, involving either the drum-membrane alone or the entire middle ear, in which it differs from the ordinary otitis media in that in the early stages of the conditon there is a marked tendency to hemorrhage, which may be observed as punctate or diffuse ecchymoses on the tympanic membrane or as bloody vesicles raised from its surface, sometimes extending beyond the confines of the membrane itself, and involving the posterior-superior wall of the external auditory meatus. The pain is more severe and is more likely to be present on pressure over the mastoid, and the symptoms of tinnitus, deafness and discharge are intensified. The mastoid is much more likely to be involved than in other conditions, and the external attic is often the subject of purulent inflammation. The diagnosis between this condition and severe simple acute inflammation is very difficult, the prognosis is not as good, and the tendency to chronicity greater than in the latter. In the upper air passages, in addition to the usual catarrhal signs, there are frequently whitish-gray patches due to necrosis on the larynx and trachea. Hemorrhage, in the shape of nose-bleed or hemorrhagic laryngitis, edema of the larynx and pharynx and abscesses of the larynx and thyroid gland have also been observed. The recurrent laryngeal nerve is frequently affected and paresis of the soft palate are among the nervous symptoms. He referred to the tendency to sinus disease in these cases, and also referred to the fact that many of the cases get well without, and many are assisted by appropriate treatment, still there are a certain number which result either in chronic sinusitis, or a transmission of the infective process to the orbital or cranial cavities, sometimes resulting fatally, such as fatal meningitis caused by an acute empyema of an accessory sinus, and too often the etiology is unsuspected, and are more likely to occur in acute exacerbations of a chronic sinusitis brought about by some infective process, such as influenza.

Prognosis and Treatment.—This was discussed by Dr. Samuel Wolfe, who stated the prognosis was almost invariably favorable to life, if the patient had none of the senile debilities, and no complications arose. He stated that the prognosis must be considered (1) in relation to life, and (2) as to the liability to complications, on account of the fine field for infection, among the prominent being pneumonia, endocarditis, pericarditis, pleurisy and meningitis. He believed the season of the year had much to do with the complications, winter being particularly favorable to pulmonary involvment, and the summer and fall to gastro-intestinal involvment. He stated that each epidemic was liable to have peculiar complications, and believed that the individuality of the patient and management of the case, as well as the sequelæ, had much to do with the duration of the attack. Among the complications following the condition which he considered in detail were influenza pneumonia, catarrhal bronchitis, etc., and the neurotic affections, such as neuralgia, hysteria, and hypochondriasis. He believed that persons who had once had the disease were more liable to a second attack, and that the treatment should be directed (1) to the fever; (2) to the pain; (3) to the respiratory symptoms; (4) to the gastro-intestinal and nervous smyptoms.

Dr. Lewis S. Somers referred to the remarkable increase in the number of operations for conditions of the accessory sinuses during the last decade, which he felt due partly to the development of surgery, but in a large measure to the increase of morbid conditions thereof, brought about by the epidemics of influenza. He stated that this winter he had seen about 15 to 18 cases of frontal sinus involvement, while in the last three or four years involvement of the maxillary antrum had seemed to be the prevailing condition. He referred to the fact that complications of the upper respiratory tract were comparatively rare in those cases who went to bed immediately upon the onset of the condition. He expressed the belief that in many instances the severe headaches and trifacial neuralgias, following influenza, were the result of catarrhal condition of the accessory sinuses, which theory was borne out by the fact that local treatment of these regions would often remove the trouble. He did not view the hemorrhagic form of otitis as peculiarly characteristic of influenza in Philadelphia, and furthermore felt that in many instances abnormal conditions of the sinuses were induced by improper douching of the nose.

Dr. Swithin Chandler referred to the fact that he had observed a great many women with diseases of the tubes, who stated that it had started with influenza, and while he had viewed these at first as due to a weakened constitution, giving a chance to a latent germ to take effect, he was later inclined to look upon it as rather the introduction of a new germ, causing the germs already in the system to become active, mentioning among the germs that might be so influenced, the gonococci and streptococci. He cited in support of this theory the fact that some cases giving this history operated on some years ago, showed the gonococcus germ quite virulent, and in conclusion urged the necessity for individualizing the cases.

Dr. Carle Lee Felt stated that in his experience there had been very little difference in the middle ear conditions, following influenza and other middle ear conditions, except the severity of the disease, and cited several cases following influenza, in which between the attacks the ears were perfectly normal.

Dr. Frank C. Hammond stated that he had also observed that the pelvic viscera might be influenced during acute attacks, and stated that he had seen three cases, two in single women, both eighteen years of age, who, on the third day, showed marked pelvic involvement. He referred to a case in which there was pain and rapidly increasing leucocytosis in which appendicitis was suspected, but exploratory examination showed the appendix to be perfectly normal, but there was an accumulation of pus in the abdomen, which was evacuated and drainage established, and the woman made a good recovery. She had been in bed about three weeks when this condition arose. He stated that he had under his care at the present time two cases, one with the loss of the sense of taste which had improved somewhat under strychnine 1/30 gr., four times a day, and one with loss of sense of smell which was still unimproved.

Dr. Samuel P. Gerhard referred to the selection of the various mucous membranes as the situs of complications attending or following the influenza, and dwelt upon the importance of producing elimination as quickly as possible. He stated that last fall there seemed to be an epidemic of streptococcic infection, and now, since the epidemic of influenza has been in progress, there seem to be a great many

cases of streptococcic infection complicating that condition. He referred to a case who complained of pain in the back, and on examination he found an old cyst had broken out, and suggested the possibility of the frequent involvement of the mucous membrane being due to some weakened condition.

Dr. P. K. Schwenck referred to the fact that the ear complications following influenza were mostly unilateral. He believed that most of the severe headaches were due to sinus complications, and emphasized the importance of rest in bed as a part of the treatment of influenza. He stated that he had very few mastoid operations following influenza, and believed that involvement of this region was more frequently caused by other conditions.

Dr. Butler, in closing, stated that in the early stages many of the cases of sinus involvement were merely congestion, and consequently anything that would relieve the congestion would relieve the condition. He also believed that the number of cases of mastoid involvement had been materially increased by the epidemics of influenza. He stated that he had never seen anything in the literature about unilateral involvement, but that it was not uncommon either in otitis media or in eustachian tube disease.

Dr. G. Morton Illman stated that he always warned the patients in the later stages, after the mucus began to collect, against blowing the nose too vigorously, and referred to two cases which had come under his observation last winter, and one this winter, of infection due to too vigorous blowing of the nose. In regard to the use of potassium iodide, he stated that, while he had been able to abort an attack of influenza, he believed the cases were more frequently complicated by otitis.

Dr. Samuel Wolfe, in closing, stated that, while he was in the habit of using considerable potassium iodide in conjunction with other drugs, he had not given it in large doses for abortive purposes. He felt that probably the complications following its use were due to the stopping of nature's methods of elimination. He referred to the frequency of the mucous membrane being the site of complications, and stated that he did not believe cases of pelvic involvement were necessarily secondary infections.

JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

SYMPOSIUM ON THE BLOOD PLATELETS.

Regular Meeting, held March 6, 1905.

Dr. Osler gave a résumé of the history of the subject. The blood platelets had, he said, attracted a great deal of attention between 1857 and 1867 after the appearance of Schulze's original article in the *Archiv für mikroskopische Anatomie;* and their clinical significance was promptly studied by Ries, who wrote the first paper on this subject. In 1873 Osler, working in London, noticed peculiar bodies in the blood of subcutaneous and mesenteric vessels of white rats; and these he found to be the individual elements of Schulze's granule masses or agglutinated plates. Zimmermann had seen the same things previously and had called them elementary corpuscles. When watched on a warm stupes Dr. Osler and others noticed marked changes rapidly taking place in the platelets which became elongated and diamond-shaped and finally appeared as threads. It was suggested that they might be parasites; but in 1878 Hayem, in a large work on the subject, called them hematoblasts, testifying to his belief that the platelets played a rôle in the genesis of red blood corpuscles. Bizzozero then showed the platelets to be individual elements and studied their relation to the red blood corpuscles working along the lines of Ranvier's previous suggestions. Next came the demonstration of the importance of platelets to blood coagulation—the work of Eberth and Schimmelbusch, which was followed by Osler's observation that white thrombi were made up largely of platelets. Modern study of the question has been concerned with determining whether the platelets were independent blood elements, whether they were precursors of the red blood corpuscles, or whether they were artefacts due to cellular disintegration. The platelets have been usually overlooked in routine examinations; and their association with disease has not been carefully studied—though great increase in the wasting diseases was noted by Osler long ago.

Histology of the Blood Platelets.—Professor Kemp, of Champaign, Ill., said that in the relatively few years that blood platelets had been known enormous literature had sprung up on the subject. The platelets were best studied, he said, after immediate fixation, or by working in a low temperature and with cold glassware when the changes in the platelets were slow and could be watched. At the end of some minutes (when studied at 40° F.) they became granular, irregular in form, gradually lost their individuality, fused into a mass and finally broke down. *Pari passu* with these changes came the clotting of the blood, the fibrin being deposited thickly about the blood platelets but independent of them—though the possibility of coagulation with intact platelets had never been proven. A smear of blood passed rapidly into salt solution (to wash off the corpuscles) and then put in one per cent. osmic acid gave a beautiful fixation specimen of platelets. There has been a good deal of discussion as to whether oval, discoid platelets were biconcave or not—due, probably, to the change in shape which occurs with the change in containing fluid. They probably do not contain hemoglobin, though Professor Kemp said that he had seen platelets, during some observations at a high altitude, which seemed to be exceptions to this statement. Their function is still a debated question, though it seems probable that they are hematoblastic. The figures given by Arnold, which the author thought proved the platelets to be degenerated red cells, probably represented artefacts. Löwit thought the platelets to be precipitated globulins and not true blood elements; but their observation by Osler within the blood-vessels and later by Bizzozero's son in the frog's mesentery and the bat's wing, seem to prove them independent elements. They are best counted by the indirect method—determining first the red blood count and then the ratio of platelets to erythrocytes. Professor Kemp found experimentally that if blood from an artery be defibrinated and injected back into a vein, the platelets (after sufficient repetition of defibrination and injection) disappeared and the blood refused to clot.

Relation to Disease.—Dr. J. H. Pratt, of Boston, referred first to the great confusion existing in the literature as to the platelets and said that there were marked differences beween these Arnold bodies, which were artefacts, and true platelets. A good preparation of them could, he said, be prepared by fixing the smear in a solution of sodium metaphosphate in sodium chloride. Stained by certain methods chromatin may be shown in them and a pseudo-

ameboid movement has been observed. In health the number of platelets varies greatly but they average about 300,000. Dr. Pratt reported a series of diseased conditions with the plate count in each. The lowest count (7,000) was made in a case of purpura hemorrhagica. The platelets were never absent but were greatly reduced in number in lymphocytic leucemia (series of 8 cases, count varying from 10,000 to 94,000) and in pernicious anemea (series of 10 cases). In secondary anemias they may be increased—a point which may be of diagnostic value in distinguishing from primary anemia. An increase in platelets was found in myelogenous leucemia (count varying from 50,000 to 1,498,000), in chlorosis, in erythrocytosis and in *severe* hemorrhage. Dr. Pratt thought the evidence was conclusive for regarding platelets as third corpuscles.

Dr. Emerson said that he had often seen pseudopsia extruded from platelets, but never any real ameboid motion with progression. The endoglobular degenerations of Maragliano had been shown to have a distinct existence; and it was possible that the platelets might represent extruded "innere Körper," or might be due to the disappearance of the red blood cell from about the "innere Körper" and nuclear material. Dr. Osler said that the changes seen in the platelets were similar to the mechanical changes occurring in red blood corpuscles, and were not truly ameboid. The great number of platelets in embryos and in wasting diseases had never been explained. Dr. Boggs referred to recent work done in Germany in reference to the relation of platelets to coagulation. It was found that if fibrinogen be treated with a mass of pure blood platelets coagulation occurred rapidly, but took place much more slowly if leucocytes were used instead of platelets.

NEW YORK ACADEMY OF MEDICINE.

ORTHOPEDIC SECTION.

Stated Meeting, held February 17, 1905.

The President, Homer Gibney, M.D., in the Chair.

Pott's Disease of the Spine.—Dr. Jäger presented this case: Symptoms began about April 1, 1896. Mother first noticed child holding head forward, and he complained of pain in back and side of neck. Examination at that time showed a well-nourished, healthy boy; walks with head slightly forward. A prominence at about the sixth cervical,—spine below seventh cervical flat and rigid. January 5, 1897: Child in good condition, wearing brace since previous May. No increase of deformity. He wore the brace off and on for two years, then discarded it. There were no symptoms until four years ago, when a boil formed on inner side of right shoulder blade. It was poulticed and broke open, and has been discharging ever since. Two years ago another abscess formed under left shoulder blade. This was opened, and has remained open ever since.

He has had general medicinal treatment—carbolic washes—but has worn no brace. His appetite has been good, he sleeps well, and gets about without any trouble. Lately he has complained of pain in back and shortness of breath. Now the boy holds head bent forward. Examination of spine shows but slight deformity, and the tracing to-day is almost identical with the tracing taken nine years ago. There are two discharging sinuses. A review of the literature shows that disease of the laminæ is very rare. The only reference to a similar case was in the *American Journal of Surgery and Gynecology* for April, 1903, where Eastman (St. Louis) describes a case in an adult.

Report of a Case of Osteitis of the Spinous Processes and Laminæ Simulating Tuberculous Disease of the Body of the Vertebra, or Pott's Disease.—Dr. Reed, House Surgeon, Hospital for the Ruptured and Crippled, (by invitation) read this paper and exhibited this patient: Frances C., aged six years, was admitted to the Hospital for Ruptured and Crippled, June 13, 1904, diagnosis of Pott's disease of the lumbar spine. She was admitted for the relief of an abscess. Nothing definite could be learned in the way of a history. She had been living near St. James, Long Island, for the last three years, and the deformity was not recognized for a month prior to her admission to the hospital. During this month it had rapidly increased, and she presented on admission uniform posterior curvature of the spine from the upper dorsal to the sacrum, but no angular deformity. There was a good deal of infiltration on either side of the spinous process, with tenderness, but fluctuation was not made out. There was a little psoas contraction on the right side, but no psoas abscess was discovered. She was put on a Bradford frame, and two months later the psoas contraction had disappeared, but there could be made out fluctuation over the spinous processes of the dorsolumbar. In December, five months after her admission, there was a distinct tumor and fluctuation under the gluteus maximus muscle on right side, and this infiltration on either side of the spinous processes had rather increased, but there was no marked fluctuation on the left side. The spinal deformity was, if anything, less pronounced. On the morning of February 14 an incision was made through the gluteus maximus down through the sac, and about six ounces of pus, with some caseous material, was evacuated. After it was thought to be completely emptied, the opening of the sac was sutured with catgut, and the skin also sutured. Then an incision was made a little to the right of the spinous processes of the eleventh and twelfth dorsal, and thick, caseous material was squeezed out to the amount of about three or four ounces. There was very little fluid. By pressing firmly over the left side as far up as the upper dorsal this material was forced out of the lower opening. A director came in contact with loose bone. The gloved finger was inserted, and the spinous processes of the lateral masses were felt completely eroded. This large sac was thoroughly cleansed with sterile gauze, and the same care taken in suturing as in the other abscess. At this time the abscess under the gluteal muscles was found to have completely refilled, and the wound was reopened and three or four more ounces of pus evacuated. After it was thoroughly emptied again it was resutured, the child put up in a plaster-of-Paris jacket and spica, and put to bed. Up to the present time there has been little or no reaction, the temperature is about normal, and the case is doing well. Microscopical examination of the pus evacuated showed pus and blood, but no bacteria of any kind.

Dr. H. C. Frauenthal presented a case about which, he said, there was nothing unusual except for the fact that he had worn a jacket for twelve years at Bellevue. He said, in his experience, many patients were discharged as cured after wearing a jacket for various periods, and he wished to show this case as exhibiting the effects of after-treatment. When this young man was discharged he had the charac-

teristic color of patients whose breathing has been restricted for a considerable time. The boy had now a ruddy complexion and an increase in chest expansion of three inches, which change had resulted from physical culture begun in May last—a period of ten months.

Colles Fracture.—Dr. Ashley showed this case. It gave an idea of how much damage such a fracture might do, and the result: Three years ago this boy had a Colles fracture. He was put up with anteroposterior splint. Had great pain and swelling. Hot applications were advised by the physician and used for about a week, and the present condition is more the result of the anteroposterior splint and hot applications than of the fracture. There is a massing of all the tendons. The arm can be straightened, but there are deep scars, due to hot applications applied with the brace. The muscles are all adherent to the scars. The palm was very much contracted, and has been a great deal worse than it is now. The styloid process had been broken or partially dislocated, and the bone was atrophied there. Also some results of the inflammatory process were seen. Nothing had been done until six months ago, when it was straightened by force, and an effort was made to liberate the tendons. At the wrist a transverse incision was made and an effort to reduce the tension upon the palm. His local doctor had treated him by massage. The flexor longus pollicis tendon is rigid. The boy has no power to flex the thumb. Dr. Ashley said he had another case exactly like that in a clinic, that came to him immediately after the injury. It was not so badly scarred as that, and by manipulating it and afterward giving massage, a perfect functional result was obtained. The injury in this case shown to-night occurred three and one-half years ago.

In response to questions, Dr. Ashley said he had tried to loosen the tendons under an anesthetic, and that wrist is loose now compared to what it was. The X-ray showed exactly what the position was before anything was done to it. It did not show the dropping of the wrist so well.

Dr. Jäger described a simple device, gotten up by Schade, in Dresden, for exercising the hand after an injury or phlegmon. It consisted of a series of highly polished wooden rods twelve inches long, graduated from two and a half inches down to the thickness of a lead pencil, with a hook at the end of each, to be fastened to a Whitely Exerciser, or similar apparatus. The patient begins with the largest rod and pulls. If the grasp be not sufficiently strong, it slides out of the hands. Next time he will concentrate his mind, and hold harder. By this scheme of treatment the patient can see if he does not exercise properly. He works at the large rod until he acquires a good, firm grip, then takes a smaller one, so on until the smallest is reached.

Dr. H. C. Frauenthal showed a case in line with the paper he had read at the last meeting. He had several such cases—women between the ages of forty and fifty—but the others could not come. One of them has almost complete anchylosis in both wrists; no motion. Exostosis is same as this woman's hands. This patient had had innunmerable doctors and all kinds of treatment—specific—here and at various springs. He thought the trouble due to gonococci. Whether this be true or not, it had yielded to treatment he had given—galvanic current and baking. She had had little internal treatment except laxatives. The joints of hands and feet were excruciatingly painful. No cultures had been made. The trouble had existed eight or ten years—mixed infection, if anything. Dr. Frauenthal thought these joints the kind referred to by Dr. Northrup in the discussion at the last meeting, as cured by this treatment, which had greatly benefited the speaker's patients. This woman had been unable to walk a block without resting, or go upstairs. In a month, after two or three treatments a week, she was much improved.

Dr. Homer Gibney said such cases were frequently seen at the Hospital for Ruptured and Crippled, and they were thought to be rheumatoid arthritis. Perhaps they were cases of gonorrheal infection, but it did not necessarily follow that this case was, as Dr. Frauenthal had no means of establishing it.

BOOK REVIEWS.

THE THYROID AND PARATHYROID GLANDS. By HUBERT RICHARDSON, M.D., Pathologist to Mount Hope Retreat; Pathologist to Maryland Asylum and Training School for Feeble-minded Children; Demonstrator of Physiological Chemistry, University of Maryland. P. Blakiston's Son & Co., Philadelphia.

No one who has followed the brilliant discoveries in organotherapy through the recent years, and has noted the far-reaching possibilities laid open by this study, can fail to show interest in Dr. Richardson's new book. He has conscientiously collected all the data upon this subject from the existing literature, and by means of his own wide knowledge of and experience with these therapeutic agents has produced a volume of exceeding interest and value. The author first presents the historic and scientific phase of the subject, giving the anatomy, physiology and chemistry of the thyroids and parathyroids. Following this, he fully describes the diseased conditions to which they are liable and their dependent functional alteration. Finally, he shows their value as therapeutic agents and the lasting benefit to humanity the knowledge of their use has contributed.

The work done upon this subject has furnished a most luminous chapter to medical science, and this volume can be recommended as an entertaining and competent dissertation upon this, as yet not widely known, subject.

CONSERVATIVE GYNECOLOGY AND ELECTROTHERAPEUTICS. By G. BETTON MASSEY, M.D. F. A. Davis & Co., Philadelphia.

THE shocking neurotic conditions often resulting from the wholesale unsexing of women has produced among modern gynecologists a reaction toward more conservative operative procedures. This point of view is evident, as indicated by the title, in Dr. Massey's recent volume.

Since the appearance of the third edition (1898), Dr. Massey has spared no pains to bring his book thoroughly abreast of recent observations and discoveries.

In Part I he finely presents the application of electrotherapeutics to the various female disorders, clearly and copiously illustrating his contentions by reports of numerous cases, and by means of excellent drawings and halftone reproductions.

In Part II he elucidates the rudimentary principles of medical electricity, the knowledge of which has become an absolute essential to the armamentarium of every practising physician. His treatment of this subject is satisfactory and sound, but it is difficult to view the extensive application of the principles in the same spirit of enthusiasm as the author.